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AMERICAN PHOTOGRAPHY

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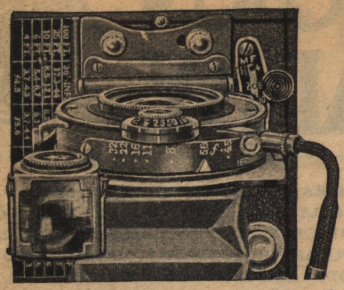

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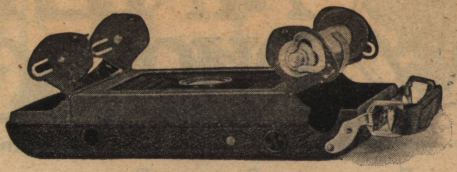

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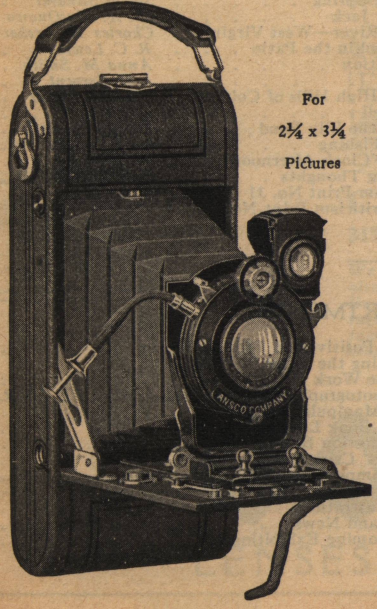

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Whole No. 400
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OCTOBER, 1922

VOL. XVI, No. 10

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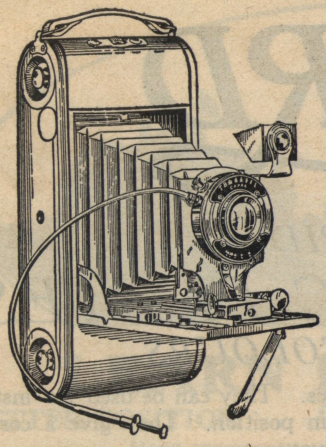

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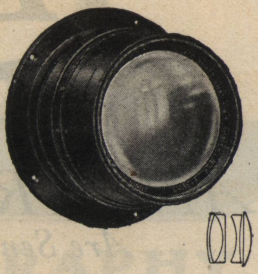

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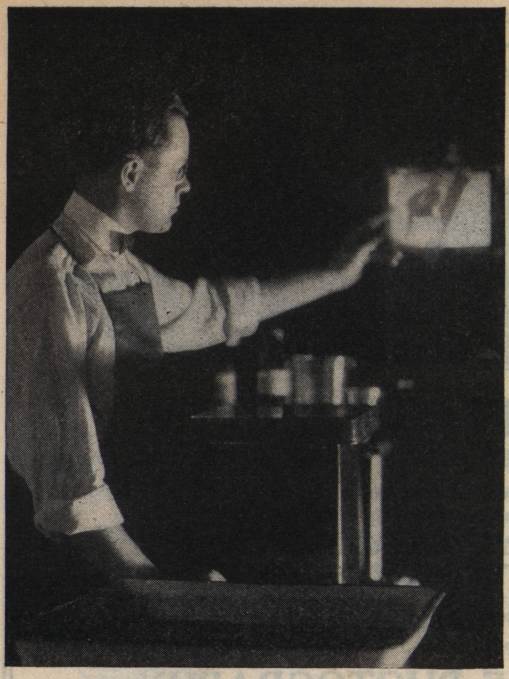

How this Man Teaches Photography all Over the World

BY B. E. SLEIGHT

THINK of teaching the science of photography with the world as a class-room! That is what the extraordinary man does who is pictured here in his experimental laboratory. No wonder his heart is in his work.

His office is the Mecca of camera enthusiasts; the headquarters to which pictures are sent for suggestion and criticism. It is this personal help and advice that accounts for the unusual success of Mr. Vant's students.

An ice-field in New Foundland—a jungle in the tropics—a breath from Japan—a "snap" of a movie scene from Hollywood—these are a part of his day's mail.

His students are as varied as the pictures they take. Men and women of every nationality and of all ages—amateurs who are taking their first snap shots and professionals of many years standing all look to this man for help and advice.

The majority of students learn during their spare time, and it is surprising how quickly their work takes on the professional look. As Director of the *International Studios, Inc.*, Mr. Vant knows just what his students must do to turn out finished professional work in their homes.

Amateurs Often Best Students

"Any one can learn to take good pictures. Then it is only a step further to *professional* work," says H. R. Vant. "Some of my best and most successful students are those with no previous experience and with but little education."

There Is Money In Photography

Most of his students want to make money while studying, so he has arranged the course of instruction to enable them to do this.

Because he is a practical and successful photographer, he can point out the things they must know to draw large salaries. He shows a student how to start in business for himself. Even as a side business, $50.00 a week is not an uncommon income.

Many Recent Developments In Photography

Modern photography is making rapid strides. Methods that were endorsed a very few years ago are today fast giving place to those that are new and more modern. Mr. Vant's instruction embodies the latest methods used by the large studios in New York and Chicago. It is constantly being revised and kept up to the last minute.

Mr. Vant says, "I will be glad to have readers of American Photography write to me. At the present time they can benefit by a special, temporary offer I am making. Please write at once as this offer must soon be withdrawn."

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AMERICAN PHOTOGRAPHY

VOL. XVI BOSTON, MASS., OCTOBER, 1922 No. 10

THE CHROMIUM SALTS

E. J. WALL, F. C. S., F. R. P. S.

HE chromium salts are probably the most important sensitizers after the silver compounds, and are very widely used in the carbon process, in nearly every photomechanical process, and also for such minor processes as intensification and cleaning vessels.

There are two classes of chromates, the normal or monochromates X_2CrO_4 and the di- or bi-chromates $X_2Cr_2O_7$ — the X here representing some element such as potassium, sodium or ammonium, or a heavy metal such as lead, copper, etc It is obvious that one may look upon the bichromates as compounds of the monochromates X_2CrO_4 plus CrO_3.

The monochromates do not interest us much from a photographic point of view, except insofar as they are supposed to be one of the products of the action of light on the bichromates in the presence of organic matter. They are very much less sensitive than the bichromates, and neither are in themselves sensitive to light. It is only in the presence of organic matter that they are reduced, and the action that takes place may be represented as follows: —

1. $2\ K_2Cr_2O_7 + H_2O = 2K_2CrO_4 + (OH)_6 + O$
2. $Cr_2(OH)_6 + K_2Cr_2O_7 = Cr_2O_3.CrO_3 + {}_3H_2O + K_2CrO_4$

The first equation may be looked upon as the primary light action, and the monochromate that is formed is but very slightly sensitive, while the chromium hydroxide, $Cr_2(OH)_6$, is decomposed with excess of bichromate, as in the second equation, into the chromate of chromium which is the real agent that acts on the organic matter. This is sometimes called chromic oxide, as it may be looked upon as Cr_2O_3.

The organic substances used with the chromates are all colloids, such as gelatine, in the carbon process, collotype and photogravure, and the rotogravure processes now so much used for the supplements for the Sunday papers. Fish glue, which may be practically considered as a liquid gelatine, is used in making the half-tone or process blocks from which the illustrations in this journal are printed. Gum arabic is another colloid used in the gum-bichromate process.

The peculiar action of the bichromates under the influence of light is to render all the colloids more or less insoluble in water, even hot water in the case of gelatine, and cold water in the case of fish glue and gum. This peculiar action takes place also with gum tragacanth, albumen, and to a lesser degree with glycerine, starch, dextrine and sugar.

In the case of the last-named, complete action, that is complete insolubility in water, only ensues after very prolonged light action; but with normal action the sugar, and the same thing applies to syrup and molasses, which are no more than uncrystallisable sugars, loses its hygroscopic nature and becomes less tacky. On this property is based the powder process, which has fallen into almost complete disuse. Here a bichromated mixture was exposed under a positive and then fine powder, such as graphite, dusted over the surface, when it adhered to those parts not affected by light.

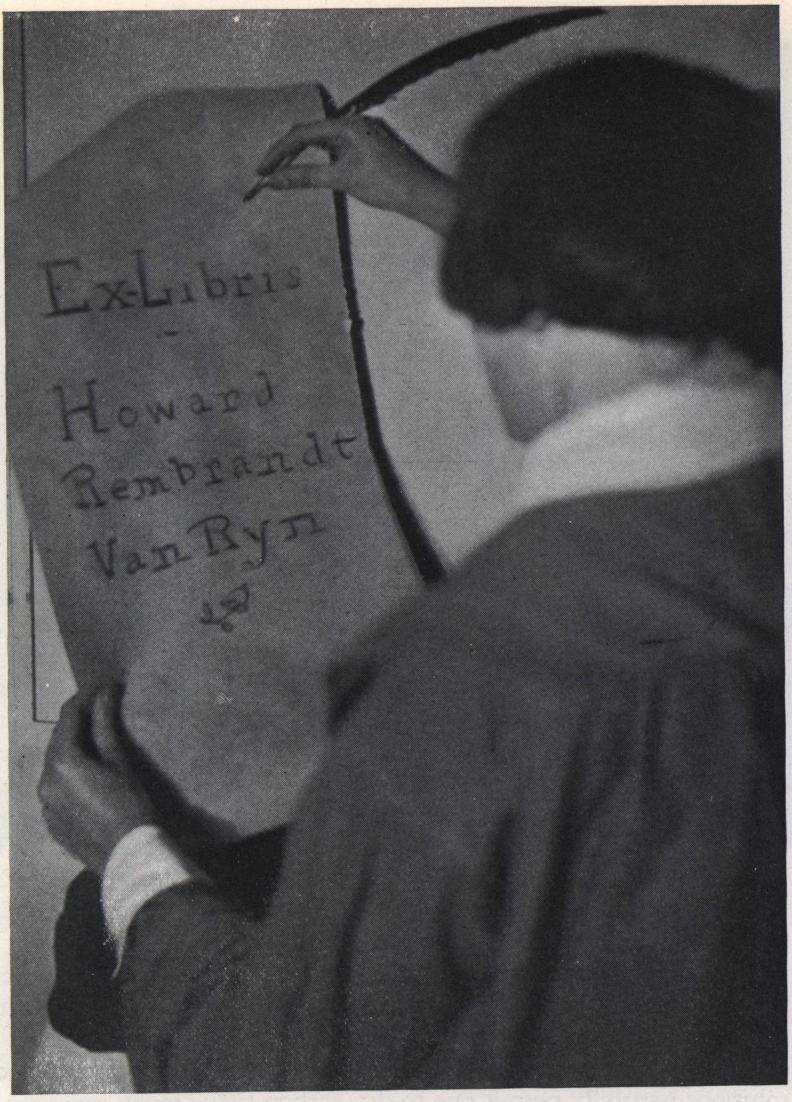
In the case of gelatine the action of light is first to cause the absorption of the oxygen set free in equation 1; but the essential reaction is a combination of the chromium chromate with the gelatine, and this new compound is completely insoluble in hot water.

It is obvious that as the insolubilization takes place in the ratio of the light acting, a more or less pronounced relief is formed, which is used for various processes. The insolubilized gelatine being practically colorless, it obviously forms a very convenient vehicle for the so-called aniline colors and is much used, therefore, in color photography for making the constituent prints of a three-color picture. Then, also, as the hardened gelatine will not absorb certain dyes, while the unaffected gelatine will, this is also utilized in color work, as in the pinatype and imbibition processes, in which the stained plate is squeegeed into contact with a gelatinized surface and the dye migrates into the latter, giving a pull in colors. Practically one may look upon these print-plates, as they are called, as similar to rubber stamps.

Probably the most beautiful process in which a bichromated relief is used is Woodburytype, which has unfortunately fallen into disuse, mainly on account of cost. In this a hardened gelatine relief is obtained and stripped from the glass, then forced with a pressure of about one ton per square inch into a soft metal, such as lead or a lead alloy. The result is an intaglio corresponding exactly to the relief. Into this intaglio or mold is poured a warm gelatinous colored ink, a sheet of paper is laid on top of the ink and a pressure plate brought down so as to squeeze out the excess of the ink. As soon as the ink is cold the plate is lifted and the paper stripped, bringing with it an absolutely permanent print in any desired color. To give some idea of the hardness of the Woodbury skin, although it may be in some places less than 1-1000 of an inch thick, it may be used fifty times or more for pressing into the metal without being damaged at all.

Bichromated gelatine not only loses its solubility in hot water under the light action, but also its power of swelling in cold. It is thus possible to obtain photographically a mold from which casts in plaster of Paris may be made, or the surface may be made conducting by rubbing with graphite and a thin skin of metal can be electrolytically deposited, forming a perfect replica of the object originally photographed. The exposed gelatine, thus having lost its power of swelling in cold water, or, what comes to the same thing, its absorptive power for water, one has but to pass a roller charged with a greasy ink over the surface and the ink will adhere to the exposed parts and not to the unexposed; then, on placing a sheet of paper in contact with the inked surface, the ink transfers to the paper and one has a collotype print. This process has again been supplanted commercially by the perfection of the half-tone process; but a good collotype is infinitely superior to the latter, as the grain that holds the greasy ink is an irregular one. Actually it is a reticulation of the gelatine surface into a series of irregular worm-like forms, which are not so apparent in the final pull as the regular cross line of the half-tone. A good collotype with a fine grain is difficult to distinguish from a silver print on print-out paper, and the fineness of the gain is completely under control.

The bichromates chiefly used are either those of potassium or ammonium, the former



A PHOTOGRAPHIC BOOK PLATE
HOWARD REMBRANDT VAN RYN

more especially. There is a corresponding sodium salt, but this is very rarely employed because it is so hygroscopic in nature that it is a nuisance to keep. Considering these salts in the same way as we have the sulphites and alkalis we can at once find their relative values from their formulas:

$K_2 \quad Cr_2 \quad O_7$

$(39 \times 2) + (52 \times 2) + (16 \times 7) = 294$

$(NH_4)_2 \quad Cr_2 \quad O_7$

$(18 \times 2) + (52 \times 2) + (16 \times 7) = 252$

$Na_2 \quad Cr_2 \quad O_7$

$(23 \times 2) + (52 \times 2) + (16 \times 7) = 262$

Neglecting the sodium salt altogether, it is clear that as the chromium is the only agent that we need consider, 252 parts of the ammonium salt are equivalent to 294 of the potassium or the ratio is 100 of the former to 117 of the latter.

The above statement is chemically correct, but photographically incorrect, because under the action of light in the presence of a colloid, the decomposition of the ammonium salt is far more complete than that of the potassium. Lumière & Seyewetz (*Jahrbuch*, 1906, 184) found that under like conditions *one hour's* exposure with the ammonium salt gave a similar effect to that of *seven weeks* with the potassium. The reason for this striking difference is that the ammonium monochromate, which is formed by light action, is with sufficient exposure completely dissociated; whereas with the fixed bichromates, potash and soda, as soon as half the chromic acid is reduced and the monochromate formed, the sensitiveness drops enormously as they are not further dissociated.

From this statement it is clear that the ammonium salt is the better of the two and the reason why the potash salt is used is on account of its cheapness. Both keep equally well, but the ammonium compound is far more soluble in water, as will be seen from the following statement, which shows the weights of each dissolved by 100 parts of water:

	10° C. (50° F.)	20° C (68° F.)
Ammonium bichromate	24	30
Potassium bichromate	8	13

A cold saturated solution of the potassium salt may be practically considered as a 10 per cent solution. This greater solubility of the ammonium salt is an advantage when one wants to use a semi-alcoholic sensitizer, because one can then add as much as 50 per cent of alcohol or acetone without the salt being thrown out, and these semi-alcoholic solutions naturally permit one to dry carbon tissue much more rapidly.

The slowing up of the light action, mentioned above, has led to the addition of ammonia to the normal sensitizer, and then one has probably the formation of the double salt $K(NH_4)Cr_2O_7$, which is naturally more sensitive than the plain potassium compound. If excess of ammonia is used the normal monochromate is formed and there is actually loss of sensitiveness. Assuming the normal carbon sensitizer to be 3 per cent solution in summer and 4 per cent in winter, not more than 2 ccm of ammonia should be added per liter, or one may use half the quantity of ammonium carbonate. This addition prevents any possibility of the occurrence of free chromic acid and the consequent insolubilization of the tissue in the dark. With excessive quantity of ammonia the tissue tends to pucker up into innumerable irregular wrinkles, or to reticulate, and these naturally are more apparent in the highlights and completely spoil a print.

We are not treating of the carbon process, but it may be considered as an axiom that the thinner the negative the weaker should be the bichromate, for this means a more prolonged light action to attain the same effect, and the stronger the print. In summer,

PANDORA
YVONNE PARK

especially in very hot weather, the strength of the bath should be reduced, otherwise more or less complete insolubility may ensue in the dark, and the tissue may begin to dissolve, for strong solutions of the bichromates dissolve gelatine without the aid of heat. Increase of sensitiveness is obtained by the addition of potassium oxalate or sulphate or chloride of copper; only about 0.1 to 0.2 per cent should be used, and the sensitiveness of the tissue is increased about three times, but naturally at the expense of keeping properties. Manganese chloride and sulphate and the alkaline citrates have been used as additions to the sensitizer but these only enhance the keeping properties, not the sensitiveness.

It should be noted that a bichromated film is not sensitive when wet; only as it dries does it become sensitive. Further, there is a continuating action of light, that is to say, after exposure the decomposition set up initially by light continues even in the dark, so that this must be allowed for if the tissue is not developed immediately after exposure.

On the principle of the adherence of a greasy ink to the exposed parts of a bichromated gelatine film is based the oil printing process of Rawlins, introduced in 1904, and which is actually a modification of the photolithographic process of Poitevin of 1855, and Mariot's process of "oleography" of 1866. In this process gelatinized paper is sensitized with bichromate, washed and placed face up on a sheet of glass or other firm support, and inked up with a greasy ink with a roller or brushes. This was practically the first of the so-called control processes, if we exclude gum-bichromate, which is actually no more than carbon with gum arabic as the colloid instead of gelatine. The oil process has been displaced in the favor of the would-be-artist photographer by the bromoil process

The bromoil process is based on one property of the bichromates that has not been mentioned, and which was discovered by Howard Farmer in 1889 (*Eng. P.* 17,773, 1889). He found that when a gelatine film containing an image of finely divided silver, such as we have in a negative or positive, is immersed in a solution of bichromate, an action takes place analogous to that of light, that is to say, the gelatine in contact with the metallic silver is rendered insoluble in hot water.

Actually the first suggestion as to the bromoil processs was made by me in 1907 (*Phot. News*, 1907, **51**, 299), where I said: "Suppose we enlarge direct on to bromide paper and develop with a non-tanning developer, such as ferrous oxalate, we should obtain an image in the ordinary way in metallic silver. If this image were treated with a bichromate, the gelatine should be rendered insoluble in proportion to the amount of silver present, just as though exposed to light. One would then only have to dissolve out the unaltered bromide and the metallic silver with hypo and ferricyanide to obtain an image in insoluble gelatine, to which the ink or pigment should adhere precisely as in the original oil process. If this would work, there is no reason why any bromide or gaslight print should not be 'oil-printed,' though I have no doubt that a special emulsion would have to be used on account of the difference in the gelatines." This idea was taken up practically by Welborne Piper and the process has become favored by the few.

In this process, as is probably well known, a bromide print is treated with a mixture of bichromate and ferricyanide, or bichromate and cupric sulphate, in which the image is bleached and the gelatine hardened, so that it takes the greasy ink where the image was.

Another process in which the peculiar action of bichromate on silver is made use of, though it is more applicable to color photography, is the production of relief images. A silver image is produced, preferably in a film, by exposure through the support, and treated with bichromate and bromide, or chromic acid and bromide, and then developed with hot water, when an image in relief is obtained exactly as in the carbon process, and the silver salt can be dissolved and the colorless relief stained up.

BECKY
CHARLES H. DAVIS, NEW YORK

We must pass over in a few words Manly's old ozotype process in which gelatinized paper was sensitized with bichromate and manganese sulphate, and after exposure squeegeed into contact with carbon tissue impregnated with a reducing mixture such as ferrous sulphate or hydrochinon and cupric chloride, and the hardening action was transferred from the exposed image to the pigment plaster, as it was termed; the print was then treated exactly as a normally exposed carbon tissue. This process was originally described by Marion in 1873, but had been completely forgotten till revived by Manly.

Later Manly introduced the ozobrome process, in which a bromide print is dampened with water and squeegeed into contact with carbon tissue saturated with a mixture of bichromate and ferricyanide, and then treated as a carbon print. This has been practically revived under the name of Carbro. There is no question that the carbon process is one of the finest of all processes; the results are permanent and can be obtained in any color. As by the use of this modification we are independent of daylight, the starting image being a good bromide print, this ought to induce many to take up the process, as having once obtained the bromide print, any number of carbons can be prepared from the same by merely washing and redeveloping after its short contact with the tissue.

As, when an acid is added to a bichromate, chromic acid is formed, it is obvious that after the addition of a halide, either hydrochloric acid or an alkaline bromide or chloride, if a silver image is treated with the mixture, we have first the formation of silver chromate and then its instant conversion into the silver halide, so that this forms a very simple means of bleaching the silver image. This has given rise to an easy method for reducing the contrasts of over-harsh or contrasty negatives, as was suggested by Eder in 1881. The negative can be immersed in:

Potassium bichromate	10 g	80 gr.
Hydrochloric acid	50 ccm	½ oz.
Alum	50 g	¾ oz.
Water	1000 ccm	16 oz.

Leave until the image is bleached right through to the glass. Then it should be well washed until it no longer shows any yellow tinge and redeveloped with a dilute developer until the shadows and half tones are quite developed, but the highlights still appear white from the glass side. Fixing the plate at this stage naturally dissolves the unreduced chloride and the contrasts are lessened.

A really excellent intensifier was also based on the same process by Welborne Piper. It has the advantage of being practically stainless, nonpoisonous and can be repeated at will. The bleaching solution may be one of the following: a 5 per cent solution of potassium bichromate and a 10 per cent solution of hydrochloric acid, sp. gr. 1.16 (containing about 32% HCl gas). The actual bleaching baths are

	A	B	C
Bichromate solution	4 oz.	8 oz.	8 oz.
Acid solution	3 drachms	2 oz	8 oz.
Water	16 oz.	10 oz.	4 oz.

Wash after bleaching until all yellow stain is removed, then develop with amidol, or use an alkaline developer and expose in the solution to daylight (not sunlight). A gives an intensification equal to mercury and ammonia; B to that of mercury and ferrous oxalate; C to that of mercury and sulphite. The process may be repeated several times

The action here is undoubtedly first the formation in the solution of chloro-chromate and the formation in the image of silver chromite As an improvement on this Lumière & Seyewetz (*Brit. J. Phot.*, 1919, **66**, 451) recommended the use of the chlorochromates them-

IN A LAND OF ROMANCE

JOHN M. WHITEHEAD

Honorable Mention, Second Annual Competition

selves and the ammonium salt is preferable. This can be made by dissolving 252 g ammonium bichromate in 250 ccm distilled water with the aid of heat and adding 197 ccm of pure hydrochloric acid, sp. gr. 1.16, evaporating till crystals begin to form, then cooling and collecting and drying the crystalline scales. The action that takes place may be represented as follows:

$(NH_4)_2Cr_2O_7 + 2HCl = 2CrO_2(NH_4)OC + H_2O$

The result should be 315 g of chlorochromate. A 3 per cent solution serves for the intensification of plates and 2 per cent for prints.

The action on the silver image is as follows:

$CrO_2(NH_4)OCl + Ag_2 = CrO_2(NH_4)OAg + AgCl$

The silver chloride is reduced to metal by the developer. It is clear that if this action is repeated there is less and less silver chloride formed each time and with five repetitions the quantity of available silver is reduced to 1-32 and the action cannot be carried further. There is a deposition of the silver chromite which is brown and gives the intensification. This would seem to offer an advantage over the original process in that one need not be careful as to the exact ratio of the acid, as if too much be used the chromium compound is dissolved and there is no intensification.

If instead of using hydrochloric acid we use sulphuric, then sulphate of silver is formed and this is soluble in water and therefore we have at once a good reducer. This is occasionally used for prints and is employed with screen plates to dissolve the primary image.

There is yet one other use for bichromate, which has today less value than when suggested by Sterry (*Phot. J.*, 1904, **44**, 50) If one has a very hard negative from which it is difficult to obtain a bromide print with full details in the highlights before the shadows are clogged up; one only need expose for the highlights, ignoring the shadows, and then prior to development immerse the print in a 1 per cent solution of bichromate for one minute. Then wash for 15 to 20 seconds and develop in the usual manner, when the full details are obtained in the highlights without the shadows being blocked up. For gaslight (development) papers only a 0.2 per cent solution should be used. With the great range of development papers now available, which enable us to choose the most suitable, this process is not so valuable.

Of the metallic chromates little or no use is made in photography. In the old days of wet plate and collodion emulsion, orange fabric or paper was made by impregnating stout paper or closely woven cloth with a 10 per cent solution of lead acetate or nitrate and as soon as surface was dry immersing in 10 per cent solution of chromate, when insoluble orange lead chromate was precipitated in the fibers, which gave an excellent safe light.

There is one use of the bichromates which does not seem to be generally known, but which deserves full attention from practical workers, and that is its application as a cleaning medium. This was suggested by Carey Lea, of Philadelphia, in the early collodion days, but has fallen into disuse because we no longer have to clean our negative glasses. A stock bottle of it is always to be found standing in my darkroom and it can be used for cleaning anything and everything, almost. It is very easy to make:

Potassium bichromate	125 g	4 oz.
Water	250 ccm	8 oz.

Then add slowly with constant stirring, or shaking, for it is just as well to mix it in the stock bottle:

Sulphuric acid	40 ccm	5 oz.

MORNING LIGHT ERNEST M. PRATT

Pittsburgh Salon, 1922

Considerable heat is evolved and the salt nearly always goes into solution. As soon as all the acid is added, add:

Water to..... 1000 ccm 32 oz.

A little of this poured into dirty dishes or graduates cleans them like magic, and it is only necessary to wash with water to have a really clean dish. Actually one has here a strong solution of chromic acid with excess of sulphuric. The only point to be careful about is that it bites the fingers rather smartly, but one can easily make a mop by tying a swab of absorbent cotton round the end of a stick, and use this if required, though the soultion is so energetic that friction is rarely required.

Occasionally one hears of bichromate poisoning, caused by absorption of the salts by the skin, but this is only to be feared when one is commercially engaged in their use, that is, one who is dabbling the hands in the solution all day and every day. In their occasional and limited use by an amateur this is not to be feared at all.

In this brief sketch of the uses of the bichromates in photography enough has been said to show how important they are, and yet we have passed over many points that might have been raised, and every process touched upon might well serve as a text for a treatise in itself.

DR. AMASA DAY CHAFFEE

JOHN WALLACE GILLIES

DR. CHAFFEE is known principally for his wonderful bromoil prints, at which he excels all others. This statement is made without qualification. Years ago he used to work on carbon, and one day when I was at his house he showed me a fat brush, which he told me came from England and cost him some seven dollars. That impressed me a great deal; it came from England, and cost seven dollars. He had taken the trouble to get a fat brush from another country, at some effort, and considerable expense, mentioning in the same breath that he was going to make bromoil prints and thought the fat brush would make it easier and better. There is a lot in this if you will consider it.

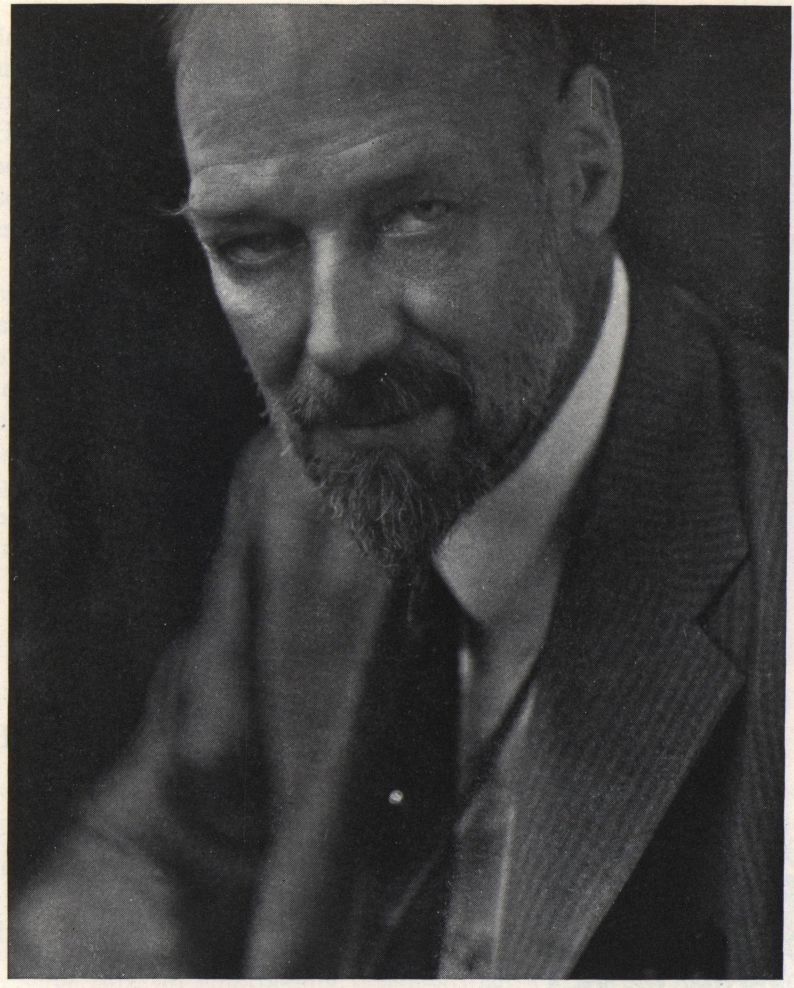
Here was a man who proposed to make a series of prints in a process new to him, and had gone to all this trouble before making a single print, this representing but a small part of the outlay, in bother and expense. It told a story of a character which would painstakingly put a great deal into a thing in the hope of getting something out. How many photographic workers would go to this trouble before beginning a thing? Herein lies the secret of Dr. Chaffee's success with bromoil; the infinite pains he takes to do the work. When he was doing carbon he did the same thing, and the prints were very beautiful; so when he put the same quality of effort into oils he accomplished more than anybody else ever did.

As to the pictures that he makes, the subjects are mainly European towns and buildings, and have the advantage of being something we do not see right along. He has spent many summers in Europe with the camera and has many negatives which have never been printed. If he never made another exposure there would be enough to supply him and two or three others with pictorial material for the rest of their lives. He makes his negatives from the standpoint of pictorial value, and pays no attention to what we call pattern or design. Perhaps it is as well. Too much pattern would upset everything but of course the writer as well as many others is a strong advocate of that method of making a picture with the camera or any other way.

Having established the fact that Dr. Chaffee arrived at the high point in photography by means of his exquisite bromoil prints, we find that he is now at present engaged in being the President of the Pictorial Photographers of America, a job which is more or less thankless, as all these jobs are. When the chief officer of an organization of this kind does a thing rightly, nothing is said; but when he makes a mistake there is a grand howl. If he is conservative there is a loud and raucous yell and if he is radical there is a similar yell. No matter what he is, he is all wrong. He hasn't got a chance. There are always factions, and they never agree; if one faction does a thing, and gets it going, the other faction registers against it with full force, and yells as previously described, and it cannot be right. All support is withheld.

Dr. Chaffee is a diplomat. Usually a diplomat is a well-mannered crook, who takes your wad with such grace and such perfect explanations, that you hand him your watch also. Dr. Chaffee is not one of these. He has the good manners, but he happens to be honest in spite of them. He has dignity; lots of it — enough so that he has been able to practically eliminate factionism, and get all hands working together. In this he has been ably seconded by Clarence White, the former president, and between the two the Pictorial Photographers have worked together to some purpose.

By this I would not mean to convey that all has gone well with them. They have



DR. A. D. CHAFFEE

JOHN WALLACE GILLIES

ambitions, and ambitions are tantalizing things, especially when they depend to a certain extent upon a bunch of phlegmatic and apathetic pictorialists, who only respond to especial personal praise. The surest way to get any pictorial worker to listen to anything, is not to explain the value of the idea, but to tell him he is the wonder of the age when it comes to making pictures. Reason is not the thing; it is too prosaic. Emotion is the thing which controls his actions. One of our most eminent pictorial workers aptly describes it as "Back Scratching." "You scratch my back, and I'll scratch yours." There is something in this, I must admit, but perhaps no more than in any other organization where art is the victim. Poor Art; he gets his every time they meet.

I tell you all this so that you will know what Dr. Chaffee has had to overcome; and with the aid of certain individuals he has done it. I happen to be a member of the Pictorial Photographers, and am doing quite a bit of work along lines especially selected by myself, where it will do a little good, and not tax me too much in time; but the members who are doing the real good are those who are giving their good time to the various matters, with no hope of reward; just to see it go. That's the finest way to do a thing.

The Pictorial Photographers start a new year this fall with the greatest promise they have ever had. Many small matters have been corrected, which needed correction, and the result should be wonderful. They are most assuredly embarking on a new year of better things, and Dr. Chaffee is steering the boat.

THE PHOTOGRAPHIC DEALER—THE SCIENTIFIC INSTRUMENT BUSINESS AS A SIDE LINE

MERVYN THOMPSON

TO TALK or write of a dealer immediately brings up to the mind a mental picture of those far-away bygone days when commodities were exchanged for commodities, in contra-distinction to the exchange of commodities for money. In those days there were no monopolies, large trading companies, income tax or rate collectors: business was a comparatively simple matter. If one desired to dispose of a possession the process was to truck the article around, until, either by luck or hearsay, you came across the "Johnnie" who was willing to buy in terms of skins, cow or what-not, that which you either required or were willing to accept as payment for what you offered. Whether we take a biological view and lay the blame on the "jelly-fish" or whether we base our standards from the time of Adam and his lady, the fact remains we have evolved to present day civilization with all its intricacies and complexities. Life has become more difficult. In business, especially in these days of slump and stagnation, difficulties face us at every turn. The happy man to-day is he who is able to say, "I am successful." Success in a type of business that had for him the greatest interest was the means whereby the worthy Kipps found the greatest happiness and contentment. To the man to whom the business side of photography appeals before the artistic or portrait side, I know of no more attractive business that that of the real high-class photographic dealer.

The photographic dealer's business is obviously rapidly developing. It is emerging slowly, but surely, from the time when this side of photography existed mainly as a side-

SISTERS — SALOME E. MARCKWARDT

Third Prize, November, 1921, Senior Competition

line to the "pill merchant," and now has a standard and dignity entirely its own. Looking at it from an economic point of view there are certain facts that must be taken clear sight of. The baker or the butcher, trading in necessities, has a probable customer in every man, woman and child, resident in the neighborhood or town. It is not everyone, however, who requires photographic goods, although there is no reason why the majority of the population should not be considered in the light of potential customers. The dealer who is at the same time an enterprising business man will always have this in mind, and be ever seeking new methods and means to stabilize or increase his turnover, to make the potential — actual. Amateur photography is becoming increasingly popular, because it appeals to the public taste, but that public has first to be "caught," and then educated to think in terms photographic. The dealer does not as a rule sell a camera in a mere casual manner because the particular instrument catches the fancy of the passer-by. Outside of sundries there are very few chance sales. An excellent window display, a reputation in the business, etc., will help to bring clients; but those clients will as a general rule be only those persons, who have by some manner or means already attained a desire to take up photography, although at first it may be only a very apathetic interest or curiosity. The question then arises, how can the photographic dealer satisfactorily introduce into his business a means to increase his turnover, that at the same time will enhance his prestige, or at any rate not be in any sense degrading?

Quite obviously the combination of druggist-photographic dealer does not tend to maintain the highest status of the profession. Admittedly it is excellent from the druggist's point of view, but that aspect of the matter we are not at the moment considering. We are however very much interested in the dealer's point of view, from that direction that places the photographic dealer first.

WINTER SUNSHINE — ALEXANDER MURRAY

Third Prize, November, 1921, Senior Competition

To hark back to those potential customers we desire to attract, it is worth while to consider the possibility of a photographic dealer carrying a stock of scientific instruments, for instance such articles as barographs, barometers, thermometers, clinometers, drawing instruments, slide rules, binoculars, opera glasses, telescopes, microscopes, aneroids protractors, compasses, salinometers, hydrometers, and even certain high-grade clocks and watches, etc., etc. A stock of such articles, or a stock of a few of the best sellers with the means of obtaining quickly any instrument especially ordered, would bring into the shop a variety of customers. Once inside the shop as an enquirer or purchaser, the dealer will not find it difficult to create and seize a real concrete opportunity to push his photographic goods. Going even further, a stock of paints, brushes and canvases, etc., will bring in the artist folk, while road maps and the like should bring a chance at the vast army of outdoor-loving people, such as motorists, cyclists, etc.

IN OLD WHITBY — J. HERBERT SAUNDERS

Third Prize, November, 1921, Senior Competition

A business of this sort should not be in any sense derogatory. On the other hand it may be the means of not only increasing the turnover upon the photographic side of the business, but the profit upon the "outside" turnover may help to carry those extra establishment charges entailed by shop premises in the main street, which up to the present have been too onerous to risk.

That a business of this sort would be successful there is every reason to believe, and a pointer is obtained from the fact that a large number of firms existing primarily for the sale of scientific instruments handle photographic goods, and moreover, handle them well.

Although some photographic dealers run their business upon these lines, still too often things seem wrongly adjusted. It is the optician that combines with his business the scientific instrument side. The photographic business still more frequently than is good for the status and prestige of the profession is pushed in to help pay the rent of the dispenser of medicines, and the seller of arrowroot and tooth brushes.

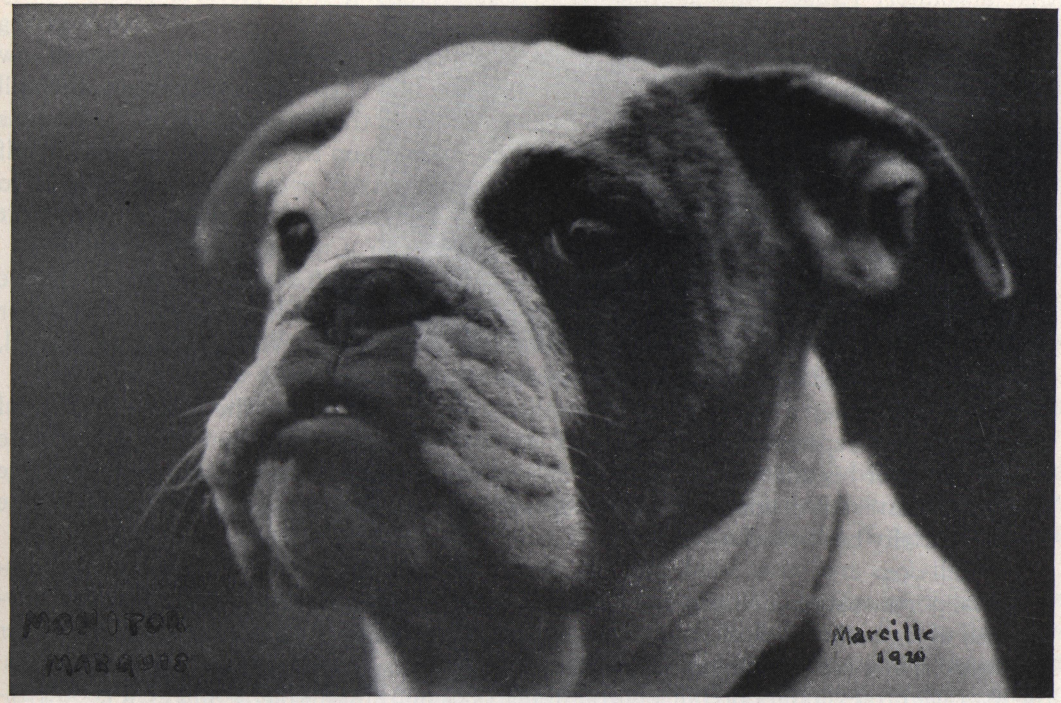
NIPELO F. W. MARCILLE

PHOTOGRAPHING DOGS

F. W. MARCILLE, BREEDER OF ENGLISH BULLDOGS

THIS is an article for those who love and understand dogs and other animals. There is a constant demand for good pictures of pedigreed animals. You are probably aware that there is a dog show held in your locality once a year, sometimes oftener, but unless you are a fancier you probably do not realize what these exhibits mean to owners and breeders. They "talk dog" just as you "talked pictures" when you made your first exposures and dreamed of making a masterpiece. Canine aristocrats have their place in the universe, and owners are always willing to pay well to obtain good likenesses of their show specimens. They want them for their friends, for advertising, for selling, and for countless uses. All you have to do is to get in touch with the owner and if you are enough of a fancier to understand something about the "points" of dogs and have sufficient photographic knowledge and skill to get good pictures, there is a lot of money for you in your town. Not in photographing dogs only, but other

ENGLISH BULLDOG PUPPIES — F. W. MARCILLE



MONITOR MARQUIS—ENGLISH BULLDOG PUPPY — F. W. MARCILLE

animals as well. It is a good plan to get a neat card printed — "John Smith, Animal Portraiture" — and let that be your "open sesame." You need not wait for the next dog show, for, probably, on your own street or in the next block there is a pedigreed animal. It might be a cat. Whatever it is, have a talk with its owner; tell him you like his animal. Usually you will find that is all that is needed. It is not hard to get the job.

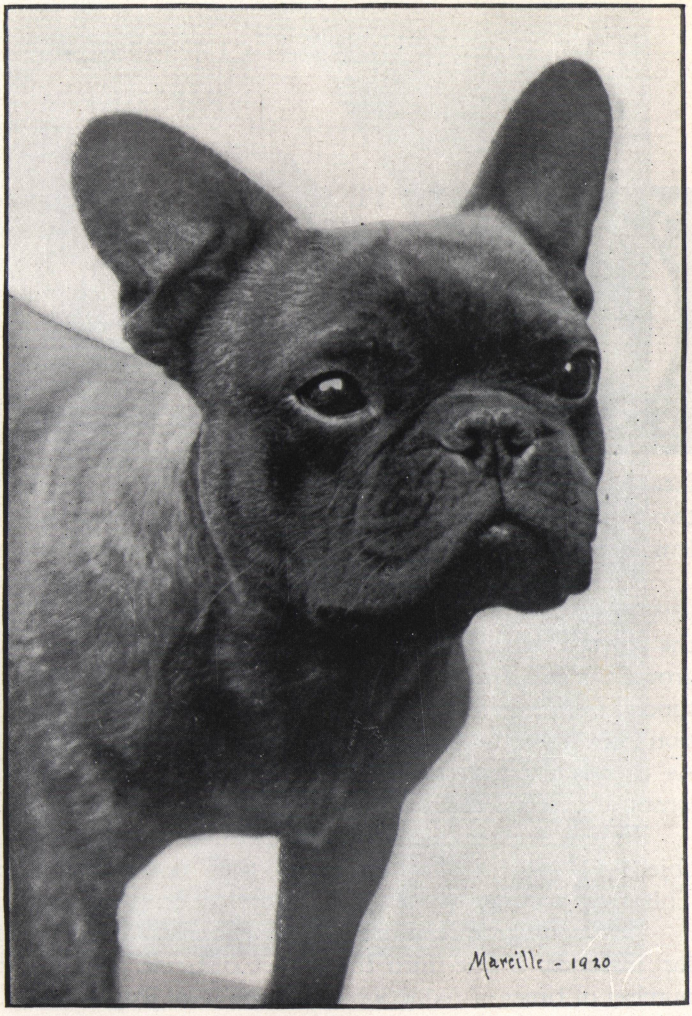
Animal photography is a branch of work which requires not only considerable skill in the use of the camera, but also knowledge and love of animals as well as resourcefulness to enable the worker to deal with adverse conditions that are bound to arise. These conditions cannot be anticipated, for they rarely repeat themselves in all animals. Saying "sic'em" to a bull terrier will cause him to be alert and all attention, but will it make a Jersey bull come to his toes and give him a glint in his eye denoting that he is eager for the fray?

In photographing dogs there are as many dodges needed as there are in enlarging negatives. You "dodge" your negatives to bring out all that is in them; likewise dogs. The writer finds that dogs, as a rule, will assume an alert attitude if the photographer makes use of one or other of the following expedients: making a buzzing or hissing sound with the lips, rattling a bunch of keys or a half filled match box, tossing a piece of paper in the air or crumpling it up. Give them something new to get their attention just previous to making the exposure; they seldom respond to the same dodge more than twice in succession. The writer recalls one of his early attempts with a litter of six puppies that absolutely refused to enter into the spirit of having their pictures taken. They were placed upon a box and they all persisted in jumping to the ground. After giving them a hearty meal, we drew a straight line across the top of the box with a piece of raw meat. The puppies toed or, rather, nosed that line like Olympic sprinters and when all were in position they were forced to their bellies and held there motionless. The day was warm and the puppies, being well fed, fell asleep, whereupon the writer stationed himself beside the camera. The pups were still sleeping and it took about three sharp barks to open their eyes and make them raise their heads. The one on the extreme left was a bit slow, but it was altogether a very satisfactory picture, for it helped to sell all the dogs.

It is not very well known that if a dog is kept upon his back and his legs held so that he cannot move, he will soon fall asleep because of the relaxation of his muscles. The writer has found that knowledge an invaluable aid in picturing a dog. When posing the animal, hold him quiet until he remains where you want him, and the rest will be easy.

It is a good plan always to keep the camera rather high, above the dog, for a truthful and satisfactory representation. A clever animal photographer in Ohio who gained quite a reputation for his animal photographs always worked above the subject, using a twelve foot tripod, and, sometimes, when photographing large animals such as horses or cows, he used a specially built platform.

Small dogs and other small animals very often are photographed in an ordinary professional portrait studio, simply because their owners want a picture and do not know anyone else who can do the work, but these pictures are very rarely satisfactory and the writer has heard many complaining of unsatisfactory results. There are many reasons for this: the average professional portrait photographer does not know what would be a good position and if he does, he seldom can take time to secure it. Usually the dog, or whatever it may be, is ill at ease in the strange surroundings. In order to get a picture that will please a fancier or a breeder it is necessary to bring out in the photograph the good points of the particular breed, such as the massive head and tremendous jaw of the English bulldog, the square-headed profile of the Airedale, the flat face of the Pekingese or the trim



RUINART SENSATION—FRENCH BULLDOG

F. W. MARCILLE

conformation of the Boston terrier. In his own yard a dog cannot help being natural, and much better results can be gained if the photographer goes to the dog instead of having it brought to him through noisy streets, so that it becomes excited and therefore behaves badly at the studio.

A visit to a dog show is recommended to a photographer who wishes to make a little extra money. Talk with some of the exhibitors: you cannot see them all, but the show catalogue will give their names and addresses so that you can call them up or write them a letter. Do not write a formal, stereotyped letter, but one that is likely to create a feeling of good fellowship. There is constant and steady business to be obtained from breeders with their new litters, and photographing their foundation stock regularly. If you can give satisfaction from the start, it will be an easy matter to build up a reputation in a very short time, for really good animal photographers are not found in every town.

COPYING

PART I

CHESTER F. STILES

OPYING is a special case of photography at close ranges, and is governed by optical considerations somewhat different from those applying to ordinary work. We will deal with the optical part in this article, reserving such matters as the technique of lighting, sensitive material, developing, and the handling of special types of copies, for a later instalment. When your lens is focused so that the image of an object is the same size as the object itself, the bellows extension is always two focal lengths. For very distant objects, the extension is the same as the equivalent focus, one focal length. For various reductions you get various bellows settings between one and two. Strictly speaking, these extensions are measured from the optical centre of the lens to the ground-glass, but approximately you may measure from the diaphragm.

You will therefore need a long-bellows camera, at least twice the focal length of your lens, or you cannot reach the condition of equal size. For every change in the distance of the object you have a change in the extension, one distance growing larger as the other grows smaller, and *vice versa*. The optician has named these mutually dependent distances, from lens to object and from lens to image, the conjugate focal lengths, in distinction from the equivalent focal length, the last being the shortest conjugate a lens may have. As this is a fixed distance for each lens, it has become the identification by which all lenses are compared in optical properties or listed for sale.

In practice, you measure equivalent focal length by making a sharp image of distant object and another of a near object, then noting the difference in the bellows extension. This gives accurate values, and the optical centre of lens does not have to be known at all.

The conjugate relations are very simple. Your bellows extension on one-third size, for instance, is one-third the object distance, which is the focal length multiplied by number of times of reductions with one focal length added. Expressed as a formula, it is

$$(r + 1)\ p = F \text{ and } F \div r = f$$

Ratio, r, is the linear and not areal relation between image and object size, p is the equivalent focus, F and f are the conjugate distances. A reduction to one fifth, with an eight inch lens, you figure 6 x 8 = 48 in., and 48 ÷ 5 = 9.6 in. Strictly speaking the ratio is one-fifth and not five, but the pair of distances comes out just the same. (1 + 1/5) 8 = 9.6 in., and 9.6 ÷ 1/5 is 9.6 x 5, or 48 in. By using the whole numbers, you can often do all the figuring in the head, and the longer distance is obviously lens to object in copying and lens to plate in enlarging.

While the use of a short-focus lens means shorter bellows extension and allows you to work at shorter distances, it has the disadvantage that the front of the camera may interfere with the lighting of the subject and cast shadows; you find it hard to get at diaphragm adjustments or to adjust the position of the copy. Longer focus lenses have optical advantages, because, at greater distances, you do not take in as great an angle, and you have less chance of reflections from glossy surfaces.

Up to their optical limits, you can make very good copies with rapid rectilinear lenses. These lenses have a falling off in definition towards the margins, and astigmatism. This

CHILD STUDY

D. J. BRODERICK

First Prize, August Senior Competition

is not completely remedied by stopping down. You do not have a brilliant image for focusing, so the exposures have to be prolonged to make up for lack of intensity of light, when the lens is stopped down for definition.

Precise copying demands high grade optics, and of course, a sufficiently rigid camera and copy-board arrangement to get rid of vibration. There are great advantages in short exposures. There is less chance for irradiation, a kind of halation where the fogging action in the black parts of negative spreads sidewise and clogs up the fine clear lines, and your chance of spoilage by vibration is lessened.

The anastigmats with flat fields let you focus at full apertures, and need very little stopping down. Their precise definition allows them to dig into the shadows and preserve detail. On account of the so-called inertia of emulsions, there is a limit of light intensity to which the plate will respond, even on prolonged exposures. Where the corrections of a lens give needle point definition as in the Dagor, the IIB Tessar, and similar lenses, you get action in every part of the image. Lenses not highly corrected really have confusion disks in place of image points, and are not able to overcome the inertia of the plate.

Stopping down the lens should only be that required to gain the necessary depth — depth of field at the copy, which may not be absolutely flat, and depth of focus enough at the image to take care of the concavity of the plate. Emulsions are always coated on the concave sides, and plates are never absolutely flat.

Small stops tend to give you flat negatives. Large lenses when stopped down give more equality of illumination than do those of smaller diameter, because they intercept fewer of the marginal rays. You will often find as good results with *f*:8 on an anastigmat as with the R. R. at *f*:16, and focusing is no longer a matter of guess work.

Copying to scale is another step upwards in precision. The lens must give correct images at all scales, and it is important that the focal plane does not shift when the lens is stopped down, which would give you a different scale in the negative from what you measured up on the ground glass, outside of the annoyance of having to refocus with smaller stops.

Lenses well corrected for curvature of field, and free from astigmatism, may still have zonal errors or residual spherical aberration. While the focus for central rays and marginal rays may be the same, intermediate zones may have incomplete corrections, hence the term zonal aberration. This of course refers to the field of the actively photographic rays and is tested by actual exposures and not by mere inspection of the ground glass image. Zonal aberration detracts from crispness of definition, and its effects have been aptly noted as resembling a drawing made with a blunted pencil instead of with a properly sharpened one.

Lenses primarily for copying, also suitable for commercial work, can be obtained of moderate speeds, but, being corrected, need no stopping down, like R. R. lenses of the same listed speed. You can choose from Cook V, *f*:8, *f*:16, Goerz Gotar, *f*:8, Turner Reich, *f*:9, Velostigmat Process, *f*:8, *f*:16, and others.

Another annoying aberration is coma, which when present will give you negatives with flat appearance, lacking contrast in the fine details. Sometimes this appearance is mistaken for errors of exposure or development, or faulty plates.

Color reproduction brings new demands on lenses, and, of course, you can apply them to the less difficult tasks of black and white work. As the lens must work with a red filter, it follows that the image with the red filter must be exactly the same size as the blue and green filter image, which means the focal length of these rays must be identical.

THE CITY BELOW

WARREN R. LAITY

Second Prize, August Senior Competition

This is of great importance to the photo-engraver, but is also of some importance in black and white filter reproductions of colored originals like rugs, or in color photographic work with separate filters instead of screen plates.

The stop values in copying are not the same as in the regular work. You will note that the illumination on the ground glass drops off as the copy images grow bigger. Stop *f*:8 for an eight-inch lens is approximately an inch in diameter. At focus for equal size images, the focal distance has increased to sixteen inches, so that the stop is really *f*:16 instead of *f*:8, and you will need four times as much exposure. With enlargements, the exposure increase is much greater. In all cases, reductions or enlargements, the increase in exposure varies as the squares of the bellows extension. Your figuring can be greatly simplified if you work with a definite size stop, and standardize your exposure practice. If at an eight-inch extension and any stop elected, the exposure is 10 seconds, it will be 2 x 2 x 10 or 40 seconds for 16-inch bellows, 2½ x 2½ x 10 or 62.5 seconds for 20-inch draw, etc. I f you wish at this point to cut down below the standard opening, you figure as in regular practice.

The exposure required on various reductions with a definite stop, as compared to exposure for copies same size as original is given in decimal figures: Same size copies, unit exposure; ¾ size, 0.76; ½ size, 0.56; ¼ size, 0.39; 1-8 size, 0.31; 1-10 size; 0.30; and below this the figures vary but little and approach the limiting figure of 0.25.

You have choice of three positions for the filter, in front of the lens, between the lens and the plate, and inside the lens. While in ordinary work the filter shift of the image plane does not seriously bother you, in copying it may be of considerable moment, and good true filters are imperative. These must be both plane and parallel, as a wedge shaped filter, or an irregular one, has the effect of a prism. You must bear in mind in copying work that rays from near objects are quite divergent, whereas from distant objects they are practically parallel. A filter which will pass muster with a 6-inch lens may not stand up for 12-inch lenses. If irregularly warped, the definition is much degraded. The process worker not only must have accurately made filters, but they must also be exactly the same thickness, so that the image planes will shift equally.

A glass filter between the lens cells is out of the question, as the delicate corrections are then upset. Gelatine filters are very conveniently used in this way and where slots for Waterhouse stops are furnished, you can make a little holder by folding a thin sheet of dark paper so that the fold goes at the bottom of the slot, and then cutting a round diaphragm opening through both sheets. Sometimes the filter can be used with the stop where they fit loosely. The paper frame keeps your fingers off the filter, which is so thin that it has no optical effect.

When behind the lens, the focus is lengthened by one-third the filter thickness. A deformed filter is equally bad when it is right behind the lens, but not so serious at the plate, although, of course, the slightest speck or scratch on the filter is going to give you a shadow on the plate. Gelatine films have been used to minimize the cost of large filters at the plate, but it is hard to keep them clean. We have found in practice that a gelatine filter behind the lens on the back of the lens board is very convenient, when a regular filter and holder are not at hand.

You will note that the front and back positions have about equal advantages, but under certain conditions you occasionally get a filter flare from light which gets through the lens and reflects between the lens surface and the filter. It may then penetrate the lens and produce fog or possibly a flare spot. Behind the lens, it is harmless, and if any re-

BABY — JUVENTINO OCAMPO

Third Prize, August Senior Competition

flected light comes through the lens, it is thrown forward out of the way. The rear position is quite feasible in copying, as the cameras used will generally have commodious lens boards.

The filter shift is backwards. It does not amount to anything on distant objects, but becomes noticeable on objects near the lens, as in copying. It reaches its maximum with copies the same size as the original. When the filter is behind, the lengthening is about one-third the thickness of filter but diminishes as the subject focused on approaches the lens. In practice, you focus with the filter in place and there is no serious difficulty.

Sometimes a photo-engraving prism is used in copying work. The focus change with this is analogous to that of a filter. Prisms have a filter effect, as thick or slightly tinted glass absorbs more violet than red. False images or flare effects sometimes occur with too wide an angle of view.

For precise work, you will need a fine-grained ground glass, which may be smeared with a little vaseline. Microscope cover glasses may be cemented on, first making a mark on glass with a fine pencil which shows through the clear circle which the Canada balsam and cover glasses have made transparent. We have seen a glass thus prepared with a tiny wire cemented between, a filament from a broken tungsten lamp. A good magnifier is used on the image, one in a tube which rests firmly at a fixed distance from the glass surface. This is focused on the mark, and the image brought to the same plane of focus. For focusing the margins, cover glasses at the corners may also be used.

The parallax focusing method is another variation. In this, the clear space is made by grinding or etching a glass screen with a protector pasted on, such as a tough piece of adhesive plaster. On this clear space a sharp-edged piece of tinfoil is stuck down. A magnifier like a cheap linen tester is adjusted to sharp focus over the tinfoil and then set permanently. Surgeon's tape will serve here. As the eye moves sidewise in viewing the image, you will see an apparent displacement. When there is no movement, the image and tinfoil lie in the same plane and at the critical focus.

Fine-grained focusing screens are easily made. Take three fast plates, unexposed, and develop them in metol-hydro without any restrainer. After four or five minutes, remove two plates and fix and wash. Remove third plate in 15 or 20 minutes. Make a solution of iodine and potassium iodide. Treat one of the underdeveloped plates and the last plate with this solution, rinse and bleach in dilute ammonia, wash and dry. You then treat the remaining plate with a solution containing 10 grains of potassium bichromate and 5 to 10 drops of hydrochloric acid to the ounce. Rinse, fix in clear hypo, wash and dry. The dense screen is an excellent substitute for your ground glass. The thin screen is of special value for your architectural work and copying. The last screen, the bichromate one, can only be used with a magnifier. You can rule lines on these screens with a sharp knife to give necessary reference marks. It is well to protect them with celluloid varnish.

No fine-grained screen is as luminous as a ground glass, but they show far more detail. All screens should be ruled with squares. You can then line up horizontal and vertical parts of the copy on the ground glass lines to quickly show when the copy and the screen are parallel.

Another device you may find useful is Le Clerc's focusing stop. This is a special Waterhouse stop with an opening across which is a bar with parallel edges, the width of the bar being about one-half the diameter of hole. When the image is out of focus, each image line which lies parallel to the direction of the bar is doubled. The two lines become one when you reach absolute focus.

You can always have a card with printed matter to focus on and some workers have a bit of fine lace on a string which they can drop down on face of copy. Your focusing glass should be fixed in focus as before stated and should preferably be of the achromatic type. Hand magnifiers and reading glasses are makeshifts. Their focus varies with distance from eye and screen, and the accommodation of the eye gives misleading effects in fine focusing. We have come across lens complaints where old-time workers have seen fit to criticize precise lenses they were trying out, the trouble really being in the focusing accuracy of the worker. You can readily see that when the lens is not critically focused, the stopping down will sharpen up the image, but there will be an apparent shift of the focal plane, not really a fault of the lens but merely that of technique.

Regular copying cameras have long square bellows, a central compartment for lenses, and a kit frame at one end for negatives which are to be copied by transmitted light or reduced to lantern slides. The lens boards may be substituted for kit frames to gain the full bellows capacity. To keep the camera front away from the copy, an extension cone is sometimes used. Such cameras for large sizes are Ingento No. 45, Crown, and Folmer and Schwing Enlarging, Reducing and Copying types, the last one having a tipping device on the kit frame for correcting distortion when copying. The Century Lantern Slide Cameras may be had in 5 x 7 size, with 36 inch bellows. The F. & S. Commercial Camera, 8 x 10 and 11 x 14, has a sectional bed and lens board movement independent of bellows.

Copying stands like the F. & S. Laboratory work horizontally or vertically, in con-

LE REMOULEUR EN PANNE J. SITEK

Second Prize, August Junior Competition

nection with cameras for copying. The Photomicrographic Stand is vertical only and of simpler construction. An old portrait camera makes an excellent substitute for a special copying camera, and a Post Card or Penny Picture camera can be bought new very cheaply and then adapted for small work.

View cameras of the type which focus from the back are most convenient. You must mount them on an improvised support so they can slide back and forth bodily, and any supplementary balancing beds should be taken off. Ingento Focusing Platforms, ordinarily used for enlarging cameras, can be utilized. The long-bellows, cycle type, plate models are excellent for copying, but as they focus in front, it is more convenient to move the easel or to lock the front of extension bed to the improvised platform so that the focusing pinion will force back the entire cameras just like the back-focusing types.

Copying with hand cameras with short bellows is only possible when supplementary

lenses are used. On models like the Goerz Tenax, 3 and 3a, Ica and Contessa long-focus models, the long bellows gives copying facilities. Ango cameras have special extension backs for this purpose. Reflecting cameras of the reversible back type are excellent for copying up to their bellows limits, which give images a little over natural size.

Direct enlarging is copying on an enlarged scale. You simply reverse your conjugate figures. The greater distance is now the camera extension, and the lesser one the object distance. If the lens is not symmetrical, you will have to reverse it, facing it the other way, so it will work the way it was corrected. This does not refer to regular enlarging cameras where the lens goes on just like any ordinary camera. The camera front is very near the subject with short-focus lenses. With long-focus lenses the extension becomes very great, so that enlarging by projection methods is generally more convenient.

DEPTH AND SHARPNESS

H. G. CLEVELAND

As a basis for our consideration of depth and sharpness we will make use of the three following formulae: —

$$(1)\ \text{Hyperfocal Distance} = \frac{(\text{Focal Length})^2 \times \text{Reciprocal of Disc of Confusion}}{f\ \text{Value} \times 12}$$

$$(2)\ \text{Nearest Distance} = \frac{\text{Hyperfocal Distance} \times \text{Distance Focused}}{\text{Hyperfocal Distance} + \text{Distance Focused}}$$

$$(3)\ \text{Farthest Distance} = \frac{\text{Hyperfocal Distance} \times \text{Distance Focused}}{\text{Hyperfocal Distance} - \text{Distance Focused}}$$

From a consideration of formulae (2) and (3) it will be seen that the nearest and farthest distances in the belt of focus are dependent on the hyperfocal distance when the distance focused remains the same. From this we see that with lenses of various focal lengths we can get the same belt of focus or depth if the lenses can be adjusted so as to get the same hyperfocal distance.

Let us now consider formula (1) for obtaining the hyperfocal distance. Assuming that the hyperfocal distance is to remain the same for the lenses of various focal length, if the same degree of sharpness is desired in the contact print regardless of the size of image, then the reciprocal of the disc of confusion will also remain the same, and the figure 12 remains the same as this is simply inserted to reduce the result from inches to feet. This leaves but two variables, the focal length squared, and the *f* value. A little consideration will show that to obtain the same hyperfocal distance, the (focal length)^2 divided by the *f* value must remain the same. That is, if the square of the focal length is ¼ as great as that of another lens with which we have previously determined the hyperfocal distance, then the *f* value will be ¼ as great, or if the *f* value of the lens of longer focus was *f* : 16, then the *f* value of the lens of shorter focus for the same hyperfocal distance and also same belt of focus would be *f*:4. Thus it will be seen that the *f* value to obtain the same depth of focus in a contact print is dependent on the square of the focal length, which is the form this formula resolves itself into when we consider the *f* value as *f*:1.

Taking the above into consideration, we can construct a table showing the equivalent *f* values for lenses of various focal lengths by placing opposite each its square and considering this as the *f* value. Then by halving and doubling these squares, etc., we can construct a table giving various comparative *f* values for lenses of various focal lengths for

A COOL RETREAT — C. V. HEWITT

First Prize, August Junior Competition

the same depth and sharpness in contact prints. Such a table is appended herewith for a few focal lengths.

TABLE I

F. L. F. L.^{2} Comparative *f* Values for Same Depth and Sharpness in Contact Prints.

3″	9″								3.1	4.5	6.2	9	12	18	24	36	48
4″	16″					2.8	4	5.6	8	11	16	22	32	44	64	88	
5″	25″				3	4.5	6	9	12	17	25	34	50	68	100		
6″	36″			3	4.5	6	9	12	18	25	36	50	72	100			
7″	49″		3	4	6	8	12	17	24	34	49	64	98	128			
8″	64″	2.8	4	5.6	8	11	16	22	32	44	64	88	128				
9″	81″	3.5	5	7	10	14	20	28	40	55	81	110					
10″	100″	4.5	6	9	12	17	25	34	50	69	100						
12″	144″	6	9	12	18	24	36	49	72	99							
14″	196″	8	12	17	24	34	49	68	98	135							
16″	256″	11	16	22	32	44	64	88	128								

As stated above, this table will give the same depth and sharpness in the case of contact prints, regardless of the size of the various images. Now let us give some consideration to obtaining the same depth and sharpness with various focal lengths when the

images are enlarged to the same size. In this case the considerations are the same as in the first case except for the fact that the disc of confusion would vary in proportion to the focal length. This can easily be seen from the following. The image with a 5″ lens is half as big as that with a 10″ lens. Therefore the diameter of enlargement with the 5″ lens to obtain the same size image as with a 10″ lens would be twice as great. Now assuming that the disc of confusion with the 10″ lens is 1-100″, since the 5″ lens is ½ the focal length of the 10″ lens, the disc of confusion with the 5″ lens would be 1-100″ x ½ = 1-200″. Now if the size of the image is enlarged 2 times, the size of the disc of confusion is also enlarged 2 times, making it 1-100″ or the same as that with the 10″ lens for the same size image.

Inasmuch as Table 1 was constructed from the squares of the focal lengths, and in this case the discs of confusion vary in proportion to the focal lengths, for Table 2 we may take F. $L^2 \div FL$ = F. L., or in other words this table may be constructed by considering the focal lengths as the *f* Values, and halving and doubling as in the case of Table 1. Such a table constructed for a few focal lengths follows:

TABLE 2

F. L. Comparative *f* Values for Same Depth and Sharpness When Images Are Enlarged To Same Size.

3″			3	4.1	6	8	12	16	24	32	48	64
4″			4	5.5	9	11	16	22	32	45	64	90
5″		3.4	5	6.8	10	13	20	26	40	52	80	
6″	3	4.1	6	8.2	12	16	24	32	48	64	96	
7″	3.5	4.8	7	9.6	14	19	28	38	56	76	112	
8″	4	5.5	8	11	16	22	32	45	64	96	128	
9″	4.5	6.1	9	12	18	24	36	48	72			
10″	5	6.8	10	14	20	27	40	54	80			
12″	6	8.2	12	16	24	33	48	66	96			
14″	7	9.6	14	19	28	38	56	76	112			
16″	8	11	16	22	32	44	64	88	128			

In case it is desired to obtain the same depth and sharpness by enlarging the images to the same size it is also convenient to know the proportionate amount of enlarging necessary, which is in inverse proportion to the focal lengths. Such a table follows for some focal lengths and various viewing distances:

TABLE 3

Viewing Distances

F.L.	12″	18″	24″	36″	48″
3″	4.0	6.0	8.0	12.0	16.0
4″	3.0	4.5	6.0	9.0	12.0
5″	2.4	3.6	4.8	7.2	9.6
6″	2.0	3.0	4.0	6.0	8.0
7″	1.7	2.5	3.4	5.0	6.8
8″	1.5	2.2	3.0	4.4	6.0
9″	1.3	1.9	2.6	3.8	5.2
10″	1.2	1.8	2.4	3.6	4.8
12″	1.0	1.5	2.0	3.0	4.0
14″	.85	1.3	1.7	2.6	3.4
16″	.75	1.1	1.5	2.2	3.0

SONG OF SPRING — SOICHI SUNAMI

American Photography Annual Competition

If a focal length longer than 12″is used, or if an image taken with the 12″ lens is enlarged, then the disc of confusion need not be changed accordingly, because in this case the viewing distance should be increased to the same distance as the focal length of the lens, or to a distance equal to the 12″ lens times the diameter of enlargement, in which case the disc of confusion would be relatively the same. In the case of lenses of shorter focal length, it is not practical to change the viewing distance, as shortening the viewing distance from 12″ is inconvenient and irritating. Therefore it is advisable to enlarge these images in the proportion of the focal length to 12″ and view at the 12″ distance. If the images taken with the shorter focal lengths are enlarged to a size larger than that taken with the 12″ focal length, then the viewing distance should, of course, be increased accordingly. The equation for determining the correct viewing distance is (4):

$$\frac{1}{\text{Focal Length}} = \frac{1}{\text{Diameter of Enlargement}} + \frac{1}{\text{Viewing Distance}} + \frac{1}{\text{Distance of Principal Object}}$$

Ordinarily the fraction $\frac{1}{\text{Distance of Principal Object}}$ is so small that it may be disregarded.

By viewing the print at the correct viewing distance not only is the depth and sharpness standardized, but we also see the picture in the correct perspective, and while the incorrectness of the perspective may not be very noticeable when viewing the picture at any

other distance, nevertheless it is not correct. For this reason it is advisable to prepare the print for viewing at a certain distance, and then make notation of the distance so that the person studying the picture may view it to the best advantage. This procedure would also eliminate the possibility of a print appearing sharper or more diffused to the observer than the photographer desired. In the case of prints made with a lens of less focal length than 12" and not enlarged, these should be viewed at a distance equal to the focal length by the aid of a viewing lens of the same focal length.

We may now construct a belt of focus table for a certain focal length using formulae (2) and (3). In view of the fact that the normal reading distance is between 10" and 14", it would seem that the best plan would be to construct a belt of focus table for say 12" focus, which is about the same as the normal reading distance. In the construction of the belt of focus table for 12" focus, some consideration should be given to the disc of confusion to be used. From the book "Optics for Photographers" by Harting, we find that to obtain a degree of sharpness indistinguishable to the eye, the disc of confusion should not be greater than one minute of arc, and that a simple way to obtain this approximately would be to multiply .000293 by the focal length. Twelve times .000293 would give a disc of confusion of about 1-300". This degree of sharpness may be advisable in cases of extreme enlargement or in the making of pictures where extreme sharpness is desired, but in practice it is ordinarily found that a disc of confusion of 1-100" for a 12" lens will be as sharp as is necessary, and that even a disc of 1-37" may be used in cases where sharpness is not so necessary and a pictorial result is desired, the latter giving the appearance of breadth rather than depth. From these considerations it would seem advisable to construct a belt of focus table using a disc of confusion of 1-100" for the 12" focal length. Such a table follows:

TABLE 4

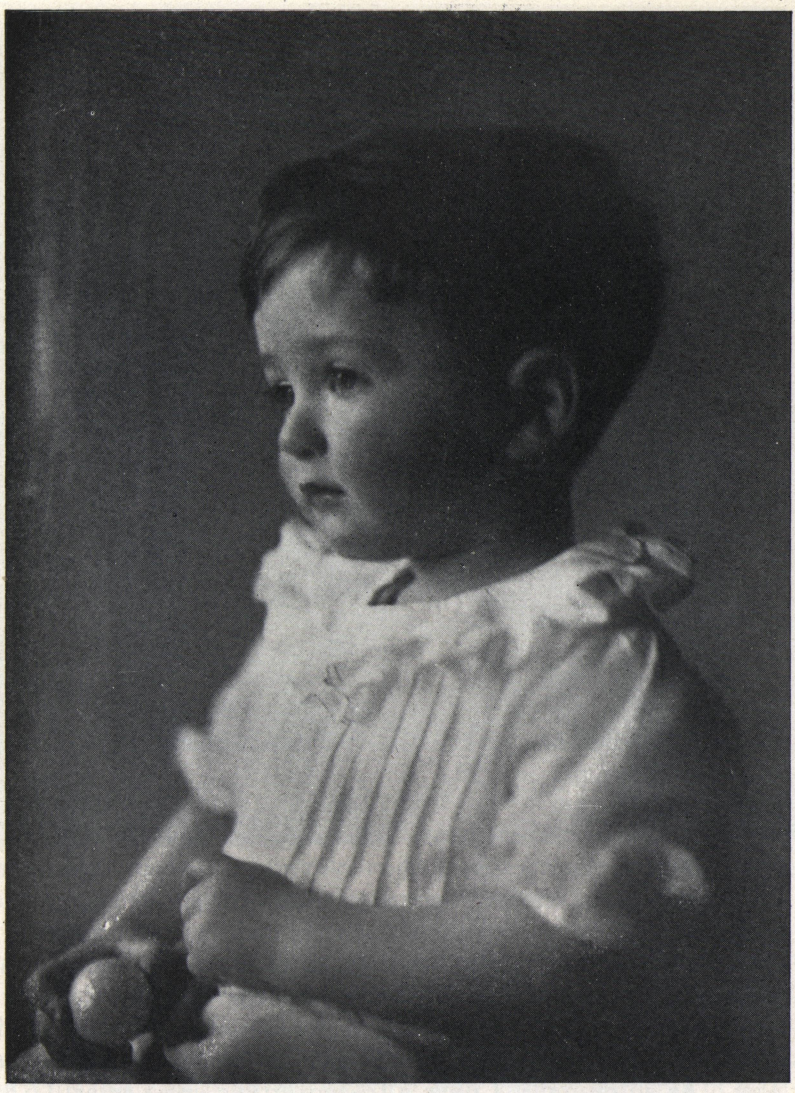
Belt of Focus. Focal Length 12". Disc of Confusion 1-100"

Value	*f*:2.8	*f*:.4	*f*:5.6	*f*: .8	*f*:11.3	*f*:16
Hyperfocal Distance Focused	436′	300′	218′	150′	109′	75′
8′	7.8′– 8.1′	7.7′– 8.2′	7.7′– 8.3′	7.6′– 8.4′	7.4′– 8.6′	7.2′–8.9′
10′	9.7′–10.2′	9.6′–10.3′	9.5′–10.4′	9.4′–10.7′	9.1′–11′	8.8′–11.5′
15′	14.5′–15.5′	14.2′–15.8′	14′–16.1′	13.6′–16.6′	13.2′–17.4′	12.5′–18.7′
25′	23.6′–26.5′	23′–27.2′	22.4′–28.2′	21.4′–30′	20.3′–32.4′	18.7′–37′
50′	44′–56′	43′–60′	40′–64′	39′–70′	34′–92′	30′–150′
100′	81′–130′	75′–150′	68′–184′	60′–300′	52′–1211′	43′–∞

Value	*f*:22.6	*f*:32	*f*:45	*f*:64	*f*:90	*f*:128
Hyperfocal Distance Focused	54′	37.5′	27′	18.7′	13.3′	9.3′
8′	6.9′– 9.4′	6.6′–10.1′	6.2′–11.4′	5.5′–13.7′	5′ –20′	4.3′–57′
10′	8.4′–12.2′	7.9′–13.6′	7.3′–15.9′	6.5′–21.5′	5.′7–40′	5.4′–∞
15′	11.7′–20.7′	10.7′–24.7′	9.6′–34′	8.3′–76′	6.7′–∞	5.7′–∞
25′	17.1′–47′	15′–73′	11′–3.37′	10.7′–∞	8.7′–∞	6.7′–∞
50′	26′–6.75′	21′–∞	17.5′–∞	13.6′–∞	10.5′–∞	7.8′–∞
100′	35′–∞	27′–∞	21′–∞	15.7′–∞	11.7′–∞	8 5′–∞

If increased sharpness or less sharpness is desired, we may still use the same depth of focus table, simply varying the stop according to the increase or decrease in sharpness desired. For instance, supposing the table indicates using *f*:8 to obtain the belt of sharpness desired with a disc of confusion of 1-100", and supposing we desired the image two times as sharp or a disc of confusion of 1-200", then we would reduce the diameter of the diaphragm one half or from *f*:8 to *f*:16, etc.

Now just a few words in reference to the use of these tables. They are advanta-



MASTER JACK

W. A. MacQuown

Honorable Mention, First Annual Competition

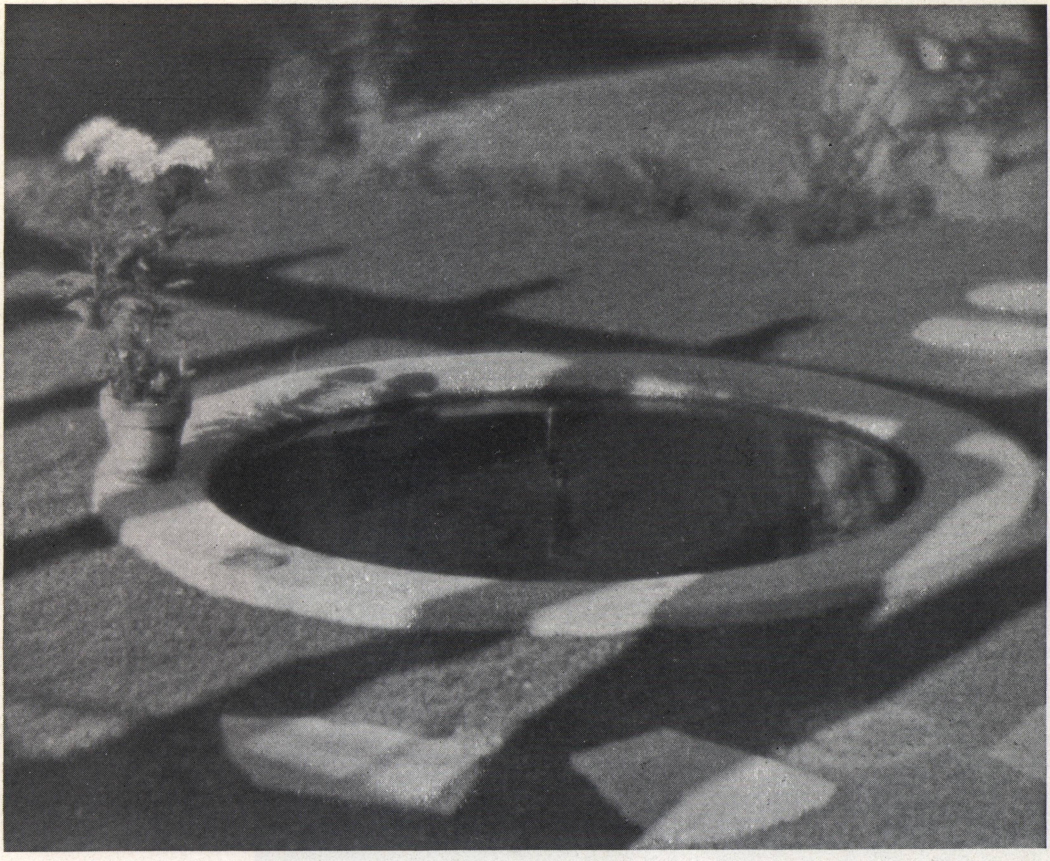
CHEAT RIVER, WEST VIRGINIA — CHARLES K. ARCHER

Pittsburgh Salon, 1922

geous to those photographers who have various lenses of different focal lengths, and who desire to get similar results when using these different lenses. Of course it must be understood that no two lenses even of the same make will give identical results. Therefore we must not expect to get the same results with an R R. lens or an achromatic as with an anastigmat. However, we may have one lens with which we are fully familiar. In this case, by making use of these tables, we can obtain similar results with lenses of other focal lengths with which we are not so familiar, with much more certainty than otherwise. As an example, I have a tri-convertible anastigmat, *f*:6.8, focal lengths 6″, 11″, 14″, and in using the single 11″ and 14″ elements my contact prints did not have the degree of sharpness desired, and I was beginning to blame the lens when I constructed Table 1. Then I took three pictures of the same thing with these three lenses, setting as indicated the 6 ″ at *f*:8, 11″ half way betewen *f*:22 and *f*:32, and the 14″ at *f*:45, when I discovered that although the sizes of the images varied, the sharpness was the same, as near as could be distinguished. These stops are much smaller than the manufacturers claim to be necessary to obtain sharp pictures; yet they are necessary for the same degree of sharpness in contact prints.

Our prints must be made either the same size as taken, or either larger or smaller. If it is desired to obtain the same amount of sharpness and depth in a contact print or a print of the same size as taken, we make use of Table 1.

In looking over these tables it will be noticed that the *f* values are not in most cases the same as those marked on the shutters. However, it will only be necessary to set the



THE POOL IN THE PATIO — R. C. LEWIS

Pittsburgh Salon, 1922

diaphragm as close as can be judged to the value indicated in the tables, as the error in setting will be so slight that the variation from the correct setting will be too small to notice any difference in the image.

If our prints are to be enlarged or reduced, then to get the same sharpness and depth, Table 2 should be used. In this case if we are working with various elements of a tri-convertible set, it is only necessary to keep the diaphragm of the shutter set at the same opening, but this table is advantageous in the case of using lenses on different cameras or in different shutters. When it comes to enlarging these negatives we should make use of Table 3, and also make notation of the viewing distance for future use when viewing the enlargement. In case the diameter of enlargement is different than indicated in the table, the viewing distance can, of course, be changed accordingly, so long as we know what the viewing distance is.

Furthermore, we either focus the image by focusing scale or by viewing the ground glass. In case we focus by scale, we can make use of the belt of focus Table 4, noting the stop for lens of 12″ focus, and using the corresponding stop for the focal length in use, according to Table 1 or 2, according to whether we intend to enlarge or not. For greater or less sharpness for some specific purpose, we can still further vary the diameter of the diaphragm, knowing just exactly what degree of sharpness we will get.

MEDITATION ANNA M. SMITH

Honorable Mention, Second Annual Competition

In case we view the image on the ground glass instead of focusing by scale, it may be argued that these tables are not necessary. Nevertheless in the case where enlargements are going to be made, the image on the ground glass will not indicate the degree of sharpness in the enlargement. In this case, to get the degree of sharpness desired in the enlargement, it is only necessary to focus on the ground glass for the degree of sharpness you wish in the final enlargement. Then, using Table 2, correct the *f* value from the focal length being used to that indicated for the 12″ focus. Then by enlarging according to Table 3 and viewing the print accordingly, the same degree of sharpness is obtained.

Even in case no enlargement is to be made, still it is not always possible to judge the degree of sharpness of the image on the ground glass with the degree of accuracy desired. In this case it might be advantageous to consult the belt of focus table, focus sharply on the distance indicated in same, and set at the stop as previously explained. The belt

HELEN J. G. SARVENT

Pittsburgh Salon

of focus table is also advantageous in determining the distance at which the camera must be placed in order to get the desired depth with the stop in use.

When using tables 1 and 2, there may be occasions when it is not possible to set the diaphragm as indicated, the *f* value being too small or too large, or for some other reason. In these cases the tables are still of value for determining the comparative amount of sharpness which is being obtained with the *f* value which is being used, as each column to the left of the one which should be used indicates 50% less sharpness, while each column to the right indicates 50% more. A thorough study of these tables will indicate many other uses to which they may be put advantageously.

DEVELOPING LARGE PLATES

It is not the lot of every photographer to undertake the production of large negatives. When such work is taken in hand there is oftentimes some hesitation in the application of the developer. The plates being costly, the results must be the best that can be obtained. Generally, a test plate of 8 x 10 size is tried in the the first place, these plates having been coated with a portion of the same emulsion that is employed in the coating of the large plates. This will enable a correct exposure being made upon the larger plate. Such tests only apply when the exposure is made in the studio, as in the case of copying and enlarging. When a portrait is to be made, or a large view, the photographer must rely upon his previous knowledge of the general quality and rapidity of the plate. Take, for instance, such a view as the skyline of New York City, upon a plate 25 by 40 inches. Correct exposure and great care in developing are essential to produce a good negative. In the case of a portrait upon a plate 25 by 30 inches, correct development is absolutely necessary.

In such cases it has always been the practice of the writer to wet the plate thoroughly in the first place before pouring on the developer. The tray being thoroughly clean, it is filled to a depth of one-third, with clean, cold water, the exposed plate being placed therein, and the tray rocked gently, so as to prevent air bubbles being formed upon the surface, the developer being already mixed for pouring upon the plate after the water has been poured off. Of course, the water must be allowed to remain upon the plate until a perfectly even, wetted surface is the result, so that no streaks are formed when the water is poured off.

An excellent developer for large plates is made up as follows — one that can be relied upon. There must be no experimenting with these expensive plates; good results must be obtained every time. Make up a solution of carbonate of soda to test 60 on the hydrometer; then make up another solution of sulphite of soda to test 40 on the hydrometer; take equal parts of each and mix them in a third bottle; mark this "mixed sodas." Prepare a solution of pyrogallic acid to measure 20 on the hydrometer; take 8 ounces of this, add 20 grains of oxalic acid, shake until the oxalic acid is dissolved. Make up a 10 per cent solution of potassium bromide by dissolving half an ounce of potassium bromide in 5 ounces of water. Having these solutions ready, the developing agent must be made up as follows: 8 ounces of the sulphite of soda solution at 40 hydrometer test is taken and poured into a large glass graduate, and add 1 ounce of the bromide solution and 1 ounce of pyrogallic solution, 2 ounces of the mixed sodas, and 24 ounces of cold water; call this No. 1. Mix in another graduate 1½ ounces of pyro solution, 8 ounces of the mixed sodas, and 24 ounces of cold water; call this No. 2. Now take 12 ounces of the first pyro mixture, and 12 ounces of the second. There are, in fact, two developers; they give very soft results. Pour this mixture upon the plate with one clean sweep, tilt the tray so as to give an even flow, watch the result. Generally this combination of developers will give a beautiful negative; if the development is proceeding all right, allow it to continue; if the image is coming up a little slow, then add 2 or 3 ounces of the strong No. 2 developer; the image will soon gain in strength. If the image is developing too fast, pour off the whole of the mixed developers, and, without washing, pour rapidly into the tray, all over the plate, the balance of the No. 1 developer. This will check the action at once; it will keep the shadows from being acted upon unduly, and the highlights will gradually build up to the required density.

As soon as the plate is fully developed, tilt the tray, drain off the developer, and flood the plate with clean cold water from the faucet. Wash the plate well, carefully lifting it so as to wash out every trace of developing solution from beneath the plate.

The fixing is best done in a chrome alum hypo fixing bath. This will give a clean, clear image. Always allow the plate to remain in the fixing solution for a quarter of an hour after fixing appears to be complete. This will insure a negative that will not turn yellow in the course of time.

The negative must be washed several times, then placed in a solution of common alum of 5 per cent. strength and rocked gently for fully five minutes. It must then be removed and washed in running water for an hour, and finally the surface very carefully wiped with a large tuft of wet absorbent cotton, rinsed well under the faucet, and placed upon clean blotting-paper or in a suitable rack to dry. The result will be a perfect negative in every particular—one that will be fit to print from in either silver, platinum, or carbon. The use of the two developers will enable the operator to control the development in such a way that no other plan offers. The value of a large negative being such that great care and pains are required in its production, it will not matter if the time of exposure should be a little under or a little over or just right. A thoroughly good negative can be made by the above method of developing. It can be made contrasty, or soft, or anything intermediate. The mixture of the two will enable the operator to judge the quality in a very short time, so that he can add either of the developers No. 1 or No. 2 just to suit requirements.

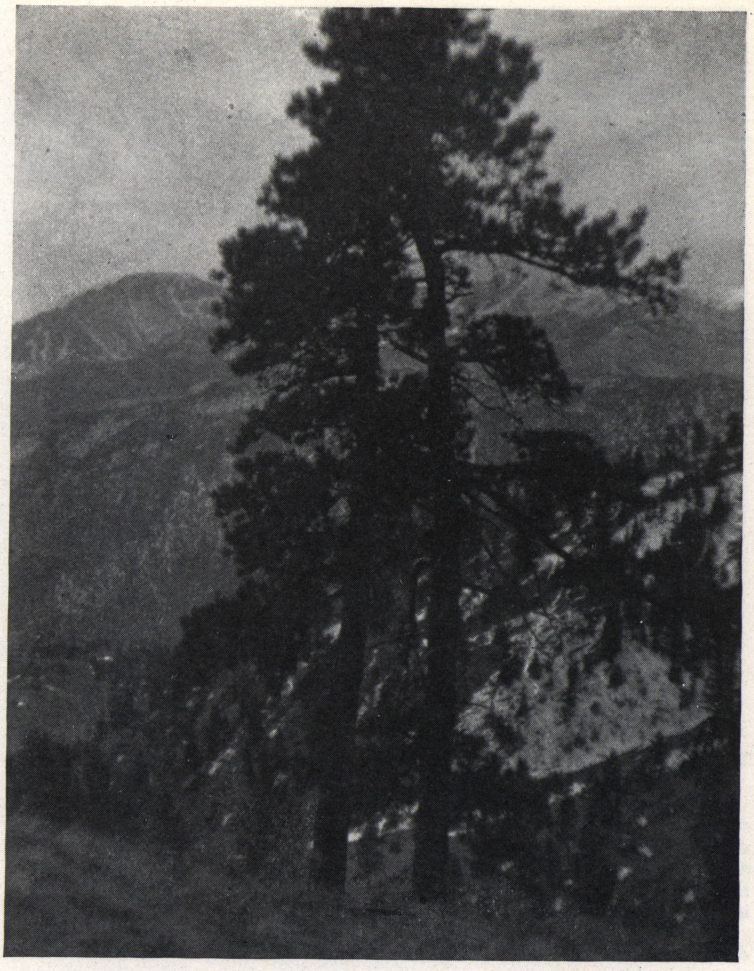
As a transparency developer for the making of enlarged negatives, No. 1 developer cannot be surpassed. It is slow in action, keeps the shadows clean, produces a very fine color, very much like ferrous oxalate. If enlarged negatives are made from such a transparency when it is only surface dry, the negative cannot be distinguished from one made direct, because the transparency thus made is almost grainless, and possesses just the color that is highly suited for the enlarging process.

Various colors in the deposited image can be obtained by mixing the proportion in a pyrogallic developer. The writer has used many other developers for large plates, but for certainty of action and reliability in securing a good negative, and securing such a negative every time, the pyrogallic developer is the one to be relied upon. Employed as described, there need be no fear of not securing just the kind of negatives desired.

Never use this developer a second time upon a large plate. There is a risk of staining and a deception in the right depth of density during development. Always use a fresh solution; then a good negative will be the result every tim

LOCAL REDUCTION

Ground cuttlefish and resin mixed in equal parts make a very good powder for rubbing down an overdense part of a negative. The best way to use it is to take some of the powder on the finger-tip and rub



IN THE HIGH HILLS OF COLORADO — THEO M. FISHER

with a circular motion on the part to be reduced. If the part is too small for this method, use the powder on the point of a paper stump. For large spaces, where more friction can be used, fine pumice and the finest grade of emery mixed together make a very good powder. The emery should be the grade used by opticians and jewelers.

IN THE HIGH HILLS OF COLORADO

In "The Artistic Side of Photography," A. J. Anderson advises the pictorialist to "expose for the tones that are most desired." That is probably the reason why Mr. Fisher gave an exposure that was correct for the sky and the light tones in the distant hills, but was not enough to register much detail in the dark pines in the foreground. The tones in the sky and distance were what he desired and the pines, being dark, set off these lighter tones to good advantage. We think a slightly different point of view would have given a better arrangement of the trees in the foreground. They are almost exactly in the center, and the line of the two tree trunks cuts up the picture in a way that is rather disturbing. The view on either side is about equally attractive and it is hard to decide which is more important. The print is one of fine quality and good, rich tone. Made with an 8 x 10 view camera, 17 inch Smith semi-achromatic lens, used at *f*:11, weak light at 5.30 P. M. in March, exposure 1-10 second on Eastman Portrait Film, developed with rodinal and printed on Palladium paper.

TINTING TRANSPARENCIES

A little careful tinting is a great improvement to a good transparency; a tastefully tinted slide is as far in advance of a toned slide as the latter is of the cold black and white monotony which so frequently makes its appearance during an evening's entertainment. Of course, this is rank heresy, for everyone knows what an inartistic abomination a colored slide is; but in this case we are not dealing with gorgeous commercial productions, but with a homemade transparency, in

THE DELL — JIRO ITO

which the main features have just that suggestion of color which so materially assists in adding atmosphere and atmospheric perspective where otherwise the methods of production hardly permit those desirable features to exist.

The method of tinting slides which is here to be described is a simple one, and no knowledge of artistic manipulation is necessary in order to produce decidedly pleasing results. The one thing which must be borne in mind is to apply all tints lightly; it is a suggestion of color rather than the actual thing that should be aimed at, otherwise we shall soon find ourselves encroaching on those wonderful emerald skies with purple clouds so dear to the heart of the professional "brother brush." A finger-dabbed firmament in Prussian blue is more suited to the "Bertillon" system of identification than the regarding of an artistically appreciative audience; we cannot, therefore, too strongly insist on the necessity of avoiding bold coloring, as the unavoidable crudeness of the more transparent colors absolutely compels careful and discriminate use in order to maintain that mellowness of tone peculiar to nature.

The clearest way of showing the method to be employed when tinting gelatine transparencies will be to imagine a subject, such as a landscape, composed of sky, distance, and foreground with foliage; but before commencing on our subject it will be well to draw up a short list of the materials required; and to avoid the trouble of mixing tints a fairly full palette should be selected.

My own plan has always been to purchase one pennyworth of the aniline color in crystal form, and then dissolve it in two ounces of distilled water. This is a decidedly vague receipt, but its simplicity should prove a recommendation, and, after all, the strength of the color is immaterial, provided it be not too weak to give the deepest tone desired. Colors can, of course, be thinned to any extent by adding water to them on the palette.

With regard to brushes, two, or at most three, will suffice—a camel-hair mop, about the size of the little finger, and two sables of different sizes, both fairly small. These are the absolute essentials, and nothing else is required, unless, when dealing with some exceptionally difficult and intricate subject, in which case crystal varnish and an additional brush are provided.

We will now commence work on our imaginary transparency, consisting, as above indicated, of sky, distance, and foreground, with foliage. The colors required will be blue, brown, and red. Place the transparency in a convenient-sized dish (say, 4 by 5) to soak, leaving it there for about five minutes, and while this is taking place mix a little of the blue with about four times its bulk of water on the palette. Now take up the transparency in the left hand, and after slightly draining it hold it in a horizontal position, and mop on the pale tint of blue, so as to cover the entire surface, including sky, distance, and foreground. As soon as the gelatine is lightly stained (say, in two to four minutes) plunge the transparency in the dish of water to remove the surplus color, and then lift it out, this time keeping the plate vertically inclined, with the sky downward. More color must now be mopped on to the sky, beginning at the horizon, and allowing it to flow toward the zenth; finally, when the sky is dark enough, the surplus must be once more washed off by immersion in the water dish. At this stage allow the slide to dry for about five or ten minutes in a horizontal position; face down, with the four corners resting on an old plate box, is the best way, as it lessens the danger of dust falling on the moist gelatine.

The brush should now be well washed and some clean water placed in the dish preparatory for the second painting.

Take some of the brown tint and mix it with water on the palette, taking care that the color be not too strong. Now hold the slide over the water dish, sky upward, and go over the distance, foreground, and foliage with a clean brush dipped in water, and afterward with the brown. By holding the slide almost horizontally, the brown color may be accumulated on it, the greater depth, however, being allowed to rest on the immediate foreground. It is by this method of flowing the tint, much as varnish is used on a negative, that the most delicately graduated tones are obtained, and the color may be worked from the palest of yellows in the distance to a tint of gradually increasing strength, which adds wonderfully to the effect of distance, and hence atmosphere, and at the same time brings the foreground up to our very feet.

As soon as the brown has done its work the surplus color must be removed by plunging the slide in the water dish, and after a very little draining it may again be partially dried for five to ten minutes, while the brush is again washed and the water in the dish changed.

The general appearance of the slide now, if all has gone well, is a graduated blue sky considerably stronger at the zenith than at the horizon, while the remainder of the picture is graduated from distance, or even the tops of the large trees, to the foreground in a mellow tint of green in gradually increasing intensity.

ACROSS THE LILY POND (*see page 656*) HAROLD B. NEAL

The third and last tinting consists in applying a second coat of brown to such parts of the foreground as are best represented by that color, always being careful to go over the part with a wet brush first, and finishing without washing the slide, as in previous paintings. The distance is sometimes much improved by filling the brush with a very thin tint of red and then passing it once or twice gently along the horizon, thus slightly warming both sky and distance. If there are any figures in the picture they should be picked out in much stronger tints than have hitherto been used, and this should be done when the gelatine has dried for a quarter of an hour or more, in order to avoid the stronger tints running, which they are very apt to do if the slide is too moist.

This practically concludes the simple process, and if entire satisfaction is not felt in the result, twenty-four hours' immersion in a pint of water will remove every trace of color without doing the slightest harm to the transparency, which may be retinted and washed several times until the desired effect is attained.

BUBBLES IN LENSES

Bubbles in lenses are the subject of many comments in the photographic press. It must not be lost sight of, however, that while they are generally harmless, a bubble which is cut into by grinding operations and left filled with polishing rouge, is quite another matter. A central bubble in a tiny wide angle lens is very bad, as, when stopped down the bubble becomes relatively large in relation to the diaphragm aperture

THE DELL

We are getting used to hearing people make such remarks as "it looks more like a painting than a photograph," for the semi-achromatic lenses when skilfully used seem to be able to splash sunlight into the negative very much in the same manner as a painter would splash it on with a brush, and the slight fringe of halation around the highlights when a strong light and a dark shadow come together is a painter's trick of softening outlines. When the photographer regulates exposure and development so that he gets correct tones, so correct that they suggest color as correct tones will do, the photograph might just as well be a copy of a good painting. And yet there are some who consider photography "mechanical" and who deny the possibility of its being classed among the fine arts. In the simple but very effective little print, "The Dell," we have an example of the power of the camera and lens to treat a subject pictorially. The subject is a simple one of no great topographical interest, and the beauty of the picture is due to the way in which the subject has been treated. The result is very much like a copy of a painting, which proves that an artist who uses a

lens can make pictures just as well as an artist who uses brushes and paints. Made in a suburb of Yokohama with a Thornton-Pickard half-plate stand camera fitted with a Verito lens of 8¾ inches' focal length, used at *f*:5.6, Ilford Screened Chromatic plate, good light at 1.15 P. M. in February, exposure ½ second, print on "Cellofix" self-toning paper, extra rough, cream.

ACROSS THE LILY POND

The "pattern" of this picture is very similar to that of a picture by Joseph F. Westgate reproduced on page 248 of the issue of AMERICAN PHOTOGRAPHY for April, 1922. We have in this case a rather too regular and not entirely satisfying arrangement of rectangular strips. The trees on the left cut off about one-third of the space vertically, and the remaining two-thirds is cut into three almost equal horizontal strips. The interesting lines and masses in the foreground almost save this picture, though they are not quite strong enough to hold the interest. Although almost everything else is mentioned, the picture maker, in gaving the data, omitted to give any information as to the exposure that was given in making the negative. From the appearance of the print, we would be inclined to think that it was not quite sufficient, for there are signs of underexposure in the shadows. In a picture like this, where there is no definite point of interest, a well placed accent would help considerably. There is a very conveniently situated rock in the foreground and if there had been a girl dressed in white (so that she would contrast strongly with the background), sitting on the rock, but not obviously posing for a picture, the artistic value of the picture would have been strengthened very much. Made in Boston, with a Seneca View camera, 8 x 10, Voigtlander Collinear II lens, used at *f*:22, sun behind white clouds, May 30th, 1920, Hammer double coated ortho plate developed with M. Q., print on Professional Cyko, studio surface.

DEVELOPING GASLIGHT PRINTS

The greater number of photographers who use it appear to develop gaslight paper in a bath of developer, immersing each print entirely in the liquid. Having developed a good many gross of gaslight prints up to 8 x 10 in the way I shall presently describe, this mode of immersion, used by many, appears to me particularly wasteful. There is also the chance of air bells, etc., which frequently show on prints so developed, and the developer is so much sooner worked out. Of course, I do not claim any novelty in this method, as I did not originate it, but I have never noticed this way mentioned in the many articles on gaslight papers that I have read.

I use generally a plate of glass, clean, and 8 by 10, or larger, in size, and, in my own case, lay this across two narrow pieces of wood, which in turn lie across a tray larger than the glass. On this glass the developing is done, and the tray underneath is merely to catch the drip and prevent it going all over the table or whatever one may be working on.

If you have the luxury of a sink and water tap in your darkroom, you can put the glass over the sink. Near at hand I have a small measure glass, with, say, 1 ounce of developer in it, and at one side a tray of clean water. After exposing the print as usual, it is placed face up on the glass, and, taking a piece of absorbent cotton, dip it in the developer in the measure glass, getting it thoroughly wet, and then rub it over the face of the print, first lengthwise, and then across, or *vice versa*, not forgetting the edges, which sometimes appear to have a habit of coming out a little slower than the center.

Continue the rubbing until all streaks have disappeared and the picture appears even and sufficiently dark, then transfer to the clean water for a rinse, and immediately put into the acid hypo bath.

The rubbing, of course, must not be too hard, though it is wonderful what the paper will stand. Rough surface paper must be especially gently dealt with, and the edges of all grades must be gone over carefully for fear of turning up the thin film of emulsion.

Prints can be wetted before developing, if preferred, but in this case the water should be allowed to drain off a little, and it will be found that the developing will take a little longer, in consequence of the slight dilution of the developer. The wetting of the print first will, however, insure even development, and it is advisable in the case of prints larger than 6 by 8. Personally, I prefer to develop the dry print.

A certain amount of local development can be done in this way, by rinsing off the developer when most of the print appears finished, and applying the cotton to the part which is slow in appearing. But it is advisable always with gaslight papers to expose properly rather than to force any part, as prolonged development almost invariably produces stained prints.

Remember to rinse off the glass plate every now and then, and to take a new piece of absorbent cotton for, say, every three or four prints. Absorbent cotton is cheap, and using one piece too long may result in brownish or greenish prints. The size of the piece of cotton may be left to the worker. The writer uses a piece about the size of a large walnut.

Using this method of development, it is really surprising how many prints can be done with a very small quantity of developer, and as to the question of time employed, I find it as quick a method as any other I know of, and I have a good deal of this work to do in a commercial way.

One other note I would like to add. Prints can be dried unmounted best by placing them face down on clean white cotton cloth or calico, provided the fixing bath contains alum, as in the bath prescribed for Velox, or Cyko paper. If alum is not used they will possibly stick to the calico.

GOING FISHING

The landscape portion of this is very interesting as an example of the work of a soft-focus lens used at its widest aperture, and with the front combination removed. It is very much diffused, but at a little distance it "closes up" very effectively and is perfectly coherent. It has an unusual amount of depth and atmosphere. The figure is rather unfortunately placed in the picture space, but it is very expressive and suggests action and energy very strongly. If it were a little out of the center it would have improved the composition. If it is possible to remedy this by making another enlargement and including more at the top and one side, preferably the right, we would strongly advise this being done, but if the negative does not permit of this, the only way in which the placing can be improved is by trimming.

GOING FISHING — JOHN N. CONSDORF

It is rather a pity the fishing rod happened to catch the light so strongly. We think it would be advisable to work out this white line by hand on the print and draw in a fishing rod that looks more like the real thing, but this will have to be done very carefully. 3¼ x 4¼ Graflex camera, Verito lens, rear combination only, of 7 inches' focal length, used at *f*:4, good light at 10 A .M. in October, exposure 1-40th second, Standard Orthonon plate developed with pyro-soda, enlargement on P. M. C. Bromide paper, No. 6.

SHADOW SIDE OF THE FACE

Contrasts are always stronger in the photograph than they appear to the eye. Frequently the shadowed side of the face seems to our vision full of the richest detail and truly our eye is not deceived for the detail is there, but in the finished portrait we discover, for some unaccountable reason, our deduction being based on appearances, that the expected luminous shadow areas have degenerated into mere meaningless black masses.

The eye is thus contributory to a false judgment of what the light is really effecting upon the film. We must not forget the influence of the mechanical phase of our art. We must bear in mind that the art is not in the camera or plate, but in ourselves. The plate remorselessly registers intensities without appreciation of exterior appearances.

When we predetermine that the shadows shall not disappoint our artistic expectation, we must take precaution that the unmeaning black areas do not predominate. We must either introduce direct light on the shadow side or rearrange the illumination to throw light in that particular part. To the trained eye the effect produced is at once manifest and the improvement directly visible.

By increasing the amount of front light, the time of exposure is relatively shortened. The whole scheme of illumination is more harmonious. The light and shadow contrast more and more decidedly by moving the model toward the source of light.

It is best to use the reflecting screen with caution. That is, use judgment, and do not overdo the shadow side and obliterate the fine detail.

The good agency of the reflected light from the floor or the walls of the studio is not always appreciated. It often is valuable in lighting up the shadows. Every radiating object near the sitter

FOUR O'CLOCK AFTERNOON — TOSHIO SOGA

acts as a reflector and sometimes it happens that an unexpected blessing is conferred, a charming result obtained without the operator's intention or the divining of the immediate cause of success.

This kind angel in disguise may have been the book which the artist placed in the hand of the model to complete the composition, but he builded better then he knew, or it may have radiated from the drapery or the garment of the model. Whatever the cause, the credit belongs to the photographer, provided he understands the cause and subsequently appropriates it.

4 O'CLOCK AFTERNOON

From the title of this picture we would judge that the maker of it deliberately and intentionally selected that particular time of day at which to make the exposure and we think he is fully justified. The splash of sunlight just striking the urn and the corner of the steps is decidedly effective, and saves the picture from being merely a record of topographical interest. The sunlight makes it pictorial. Sunlight is the theme of the picture, and the building and everything else is merely the setting for the theme. The quality of definition is very fine, showing that the lens was used with skill and experience, and the picture is one of unusual pictorial interest. We think we would have emphasized this splash of light even more by trimming off enough from the top of the print to remove the patch of sky in the right hand upper corner; however, this has been darkened and is not very obtrusive. Made in New York City with a Speed Graphic 5 x 7 camera, Wollensak Verito lens of 9 inches' focal length, used at *f*:4, good light in April at 4 P. M., exposure 1-75th second, Eastman Seed 30 plate developed in M.Q., printed on Artura E.

DIRECT POSITIVES ON BROMIDE PAPER

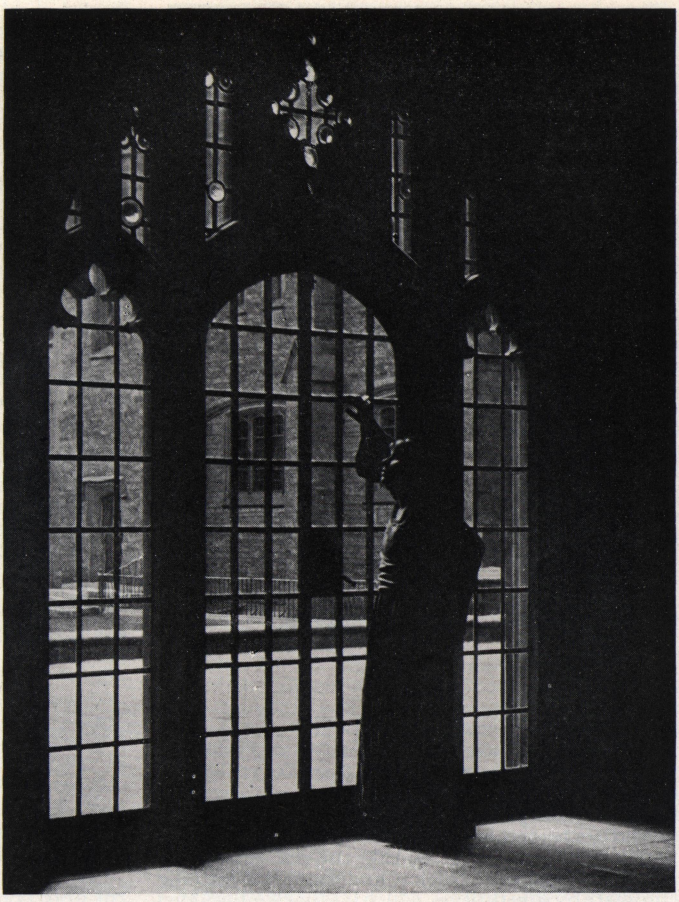
For rapidly copying documents, articles in journals, line drawings, etc., a direct photograph on bromide paper is very satisfactory if the photograph is made through a prism to avoid reversal. A well-known example is the use of the Photostat machine, in which the operations of development and fixing are performed automatically after exposure in the camera, the paper being cut off from a roll, so that a great number of photographs can be taken in succession. This method, of course, produces a negative, and for much work a negative has no disadvantages. On most occasions, however, a direct positive is desirable, and such positives can be obtained on the bromide papers used for copying work, by two different processes.

The first method is the well-known one whereby the developed, but unfixed, print is bleached out in an acid permanganate bath, and the residual image of silver bromide exposed to light. This, on development, gives a positive black-and-white image. Good results are obtained by observing the following instructions.:

The exposure must be sufficient so that development is complete in about two minutes, using the developer recommended for the particular paper used. After washing the print for five minutes it must be bleached by bathing for one minute in the following bleach bath:

Potassium permanganate	30 gr.
Sulphuric acid (strong)	150 min.
Water	32 oz.

Rinse and immerse in a dilute solution of sodium bisulphite to remove the brown stain, working in full daylight, and rinse and develop in the developer first used; then fix and wash in the usual way.



EVENING THOUGHTS — GORDON SPARLING

Any slight stain that remains in the print can be removed by bathing in a weak solution of potassium cyanide, being careful to take the print out the moment the stain disappears, or the silver image itself may be attacked.

A second method, worked out in the research laboratory of the Eastman Kodak Company, calls for developing in the usual manner, converting the unexposed silver bromide into silver sulphide and then removing the residual silver image, leaving a positive image of silver sulphide.

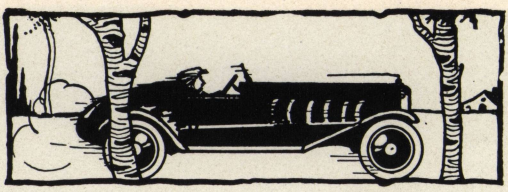
The exposure may be made in an ordinary plate holder, keeping the paper flat with a sheet of clear glass, and must be adjusted so that development is complete in two to three minutes in the following developer at 70 degrees F

EVENING THOUGHTS

Appropriately printed in a blue tone, this is indeed a striking and unusual picture. The photographer was fortunate to have access to such an interesting subject and he was able to make good use of his opportunities through his possession of the necessary skill and experience to do it full justice. The technical treatment is very good and there are evidences that some thought and care were given to the arrangement of the subject. We think, however, that a slightly longer exposure would have tended to give a less contrasty print, and a trace of detail in the shadows which would have been an improvement. Made in Toronto, Canada, Graflex camera, Wollensak lens of 7 inches' focal length, stop *f*:16, strong light at 4.30 P. M. in June, exposure 1-25th second, Premo film pack developed with pyro, enlargement on P. M. C. No. 9, toned blue.

MOUNTING THE FILTER IN WIDE ANGLE WORK

Filter mounts sometimes cut into the field of view when used with extreme wide angle lenses; the thicker the filter, the more chance there is of a cut-off. The filter changes the direction of the light rays as they pass through, but, if the filter is optically true, as it should be, the rays emerge parallel to their original direction. A very easy of overcoming any difficulties of mount interference when using an extreme wide angle lens on a view camera is to use a gelatine film filter pinned on to the back of the lens board, over the hole in the lens board. This usually can be done, because a wide angle lens very seldom projects through.



THE PHOTOGRAPHIC REVIEW

E. J. WALL, F. C. S., F. R. P. S.

CHROMATE OF SILVER PRINTS — Chromate of silver is said to be not sensitive to light under ordinary conditions and to be one of the permanent salts, yet prints can be prepared by a process of substitution. Dissolve sixty grains of sulphate of nickel in 1 ounce of distilled water and add ½ ounce of saturated solution of potassium bichromate. Brush this over paper in yellow light and dry in the dark. Expose under a negative, to sunlight if possible, until the paper which at first turns brown becomes white, and then pass quickly over a weak silver nitrate solution. Almost instantly a fine positive of silver chromate is said to be formed, which only requires washing in water.

Another method is to print on collodion paper until the image is entirely bronzed, in fact the image may appear lost and the whole paper black. Wash thoroughly and then immerse in:

Hypo.....1 oz.
Water.....16 oz.
Potassium bichromate, sat. sol.....½ oz.

to which add a drachm or two of citric acid solution, 60 grains to the ounce. Place the prints in this until they turn a brick red and all mottling disappears, then wash and dry. The object of the deep printing is said to be the formation of an image composed partly of metallic silver, so that the chromic acid of the bichromate can attack it and convert it into the chromate by substitution, which is considerably aided by the citric acid. In fact the converting action does not take place until this acid is added (*Camera*, 1921, **25**, 431). The statement that silver chromate is not sensitive to light is not quite true. As a matter of fact Vacquelin, who discovered chromium in 1798 (*Ann. d. Chim.*, 1798, **25**, 21) stated that chromic acid formed "un précipité du plus beau rouge de carmineau," a beautiful red precipitate, with silver nitrate, which turns purple in light. In 1809 (*Ibid.* **70**, 70) he stated that silver chromate browns in light. R. Hunt in his *Researches on Light*, 2nd edit., 1854, points out the change of silver chromate. And Mungo Ponton (*Edin. Phil. J.*, 1839, 169) was led by his experiments with this salt to the discovery of the light sensitiveness of bichromated colloids, which now forms such an important branch of photography. With the first formula, some nickel oxide would probably be formed and it is quite possible that there might be silver chromate formed. In the second case we have merely the reducing action of bichromate in the presence of hypo, that is to say the black overprinted image is merely reduced by the bichromate. The citric acid, which is said to be essential for the success of the process, merely decomposes the hypo and gives rise to sulphur toning, and there is no silver chromate formed at all.

Since the above was written I have stumbled on the fact that this so-called chromate printing was first published in 1907, and was abstracted in an English publication, with the following comment: "We usually ignore in this section of the———— recommendations — and there are many of them,— which are palpably impracticable or unsound, but the fact of the above suggestion emanating from a writer whose so-called researches appear in almost every American photographic paper renders it advisable to point out that Mr. ———'s toning mixture is nothing more or less than a sulphur toning bath produced by the action of the potassium bichromate upon hyposulphite of soda. In suggesting that the prints consist of silver chromate, Mr. ——— puts forward not a single fact in substantiation. In short, his process is a rapid and effective means of spoiling good collodion paper.— *Ed.*"

SOAP PRINTS — To prepare these dissolve about 20 grains of pure hard cocoanut oil soap in 4 ounces of water and add gradually about 40 grains of potassium chloride; allow the mixture to stand for an hour and strain off and squeeze out the curd. Float paper in the liquid in the ordinary way and dry. Sensitize on a bath of silver nitrate 60 grains to the ounce by floating, which is better than brushing on, dry and print. After the print is removed from the frame plunge into weak acetic acid, about 1 in 128, and allow to remain for some minutes. Tone if desirable in an acetate of soda and gold bath and wash (*Camera*, 1921, **25**, 474). The action of the chloride is merely to precipitate the soap and there would be none left, so that the salting solution would only be the potassium chloride plus possibly some impurities. One can hardly call such soap prints, and we are left in doubt as to whether the prints are to be fixed, as nothing is said about this. It is possible to prepare silver salts of the fatty acids as used in soaps; but they are all very slow as compared with silver chloride and do not as a rule give intense prints, as proved by Marktanner-Turneretscher (*Sitzber. k. Akad. Wiss. Wien.*, 1887; *Cassell's Cyclopaedia of Phot.*, 1912, 490).

THE FIRST PHOTOGRAPH. — G. Cromer defines the word photograph as the image of an object drawn by the camera and registered in a durable manner on a sensitive surface. He recalls the fact that Davy obtained silhouettes by means of the solar microscope on paper impregnated with silver chloride, but that he could not fix them. Herschel discovered the solvent action of the hyposulphites on the silver salts in 1839. Daguerre announced his discovery in the same year, and this was led up to by Niepce's communication of his process with asphalt on tin. An excellent facsimile letter by Niepce is reproduced, and from this it is clear that as early as May 26, 1826 he had obtained permanent photographs on tin by means of asphalt. The letter is written to his nephew, Isodore Niepce, and he states that he had obtained some new tin plates that he had found to give the best results "pour les points de vue d'aprés nature." Fouqué (*La verité sur l'invention de la photographie*, 1867) and Potonniée (*Bull. Soc. franç. Phot.*, 1921) contend that Niepce had obtained photographs on glass by the asphalt process as early as 1822 (*Bull Soc. franç, Phot.*, 1922, **64**, 69).

KEEPING FERRICYANIDE SOLUTIONS. — These, it is probably well known, are difficult to keep, and it is recommended to add to the solution twice the weight of common salt, and to keep the solutions in yellow glass bottles and in the dark. (*Photo. Ind.*, 1922, 176.) One of the best things to do is to add a crystal or two of potassium bichromate to the solution and boil and immediately bottle up.

A WELL-BALANCED DEVELOPER — C. S. Livingston gives the following as a universal formula for plates and films of all kinds, though with some, development must be carried apparently much further than it should be. For those who want mighty good detail, and well rounded out softness, this is the developer:

No. 1

Water	1000 ccm	32 oz.
Sodium sulphite	15.5 g	½ oz.
Oxalic acid	1 g	15 gr.
Pyrogallol	31 g	1 oz.

No. 2

Water	1000 ccm	32 oz.
Sodium sulphite	62.5 g	2 oz.

No. 3

Water	1000 ccm	32 oz.
Sodium carbonate	15.6	½ oz.

No. 4

Water	1000 ccm	32 oz.
Metol	1.3 g	20 gr.
Hydrochinon	3.25 g	50 gr.
Sodium sulphite	15.5 g	½ oz.
Sodium carbonate	15.5 g	½ oz.
Potassium bromide	3.25 g	25 gr.

Mix all in the order given, and for use take 4 parts of each of the solutions and add 16 parts of water. More water will increase the softness and less will diminish it, lessening the time to develop (*Abel's Phot. Weekly*, 1920, **26**, 471).

A NEW HYPO-ALUM BATH FOR SEPIAS. — S. Zanoff gives the following as doing away with the "sick-looking sepias that so many photographers produce:"

No. 1

Boiling water	128 oz.
Hypo	20 oz.
Alum	2 oz.

Boil for two minutes, allow to cool and add:

Sodium phosphate	2 oz.

No. 2

Silver nitrate	60 gr.
Water	1 oz.
Potassium bromide	180 gr.
Water	1 oz.

Pour the bromide solution into the silver solution and add, precipitate and all, to the cool hypo-alum bath. If added hot the precipitate turns black.

No. 3

Gold chloride	15 gr.
Water	2 oz.

Add to the above mixture. In this, lukewarm, the prints are immersed for about 7 minutes, then rinsed and placed in the following until they turn sepia:

Water	128 oz.
Hypo	1 lb.
Alum	4 oz.

Boil 10 minutes and when cool add:

Water	1 oz.
Silver nitrate	30 gr.
Potassium bromide	30 gr.

The prints should be printed the depth desired, as they will not bleach by this process. The warmer the tone desired the less the time the prints should be kept in the first bath, and the colder the tone desired the longer they should be kept in (*Abel's Phot. Weekly*, 1921, **28**, 767). The first bath is that recommended for Artura paper in 1911, and it was the first with sodium phosphate and gold, I believe.

A REAL CURE FOR METOL POISONING. — C. S. Livingston gives the following as a perfect remedy for this trouble:

Boric acid	2 oz.
Alum	2 oz.
Zinc sulphate	2 oz.
Carbolic acid	1 drachm

Powder and mix and add one teaspoonful to a quart of water, and heat as hot as the hands can bear. Use night and morning. This will toughen the skin as well as heal. Treat the hands with a 1.5 per cent solution of sulphuric acid before putting them into the chemicals and after; use peroxide soap. Anoint the hands very freely at intervals with Daggett & Ramsdell's cold cream and use no other. (*Abel's Phot. Weekly*, 1922, **29**, 86).

PASTE FOR CLOTH-BACKING PRINTS — R. M. Harford recommends this paste for backing prints: place 2 drachms of gum tragacanth in 16 ounces of water and leave over night. Add this to 48 ounces of water and 1 lb. of flour. Stir slowly to a paste in a double boiler working the liquid slowly into the flour to avoid lumps. Cool and add:

Nitric acid c. p.	2 drachms
Gelatine	1 drachm

Dissolve the gelatine in ½ oz. warm water and add:

Oil of cassia	1 drachm
Salol	1 drachm

Force the completed mixture through a cheese-cloth bag. To thin add water; if too thin let it thicken by evaporation. (*Abel's Phot. Weekly*, 1921, **28**, 414). Surely the use of nitric acid is somewhat dangerous, if the print is a silver image.

BLOOD-RED TONES ON BROMIDES — Deep red tones can be obtained on bromide prints by treatment with:

Cupric chloride	125 g	480 gr.
Distilled water	1000 ccm	8 oz.

Immerse until thoroughly bleached, then wash well and place in a concentrated (?) solution of sodium sulphide, again wash and transfer to the copper bath diluted with 10 parts of water (*Camera*, 1921, **25**, 542).

THE ACID FIXING BATH. — F. A. Elliott has patented a new form of acid fixing bath, in which it is claimed the acidity is retained until the fixing power of the hypo is exhausted, relying on the so-called buffer substances to maintain the acid condition. The neutral or slightly acid salts of the alkalis, including ammonia, should be used, and preferably the salt of the particular acid used, thus a citrate with citric acid and sodium acetate with acetic acid. The following are typical formulas:

Hypo	300 g	5 1/3 oz.
Sodium sulphite	50 g	384 gr.
Glacial acetic acid	2.4 g	18 gr.
Sodium acetate	10.5 g	81 gr.
Water	1000 ccm	16 oz.

Or

Hypo	166 g	2 2/3 oz.
Sodium sulphite	33.3 g	233 gr.
Citric acid	6.6 g	51 gr.
Sodium citrate	8.8 g	76 gr.
Water	1000 ccm	16 oz.

A hardener such as alum (60 g or 460 gr.) may be added (*U. S. Pat.* 1,411,687, 1922).

GRADATION IN BROMIDES. — E. Fancourt recommends the following developer for bromide prints, as giving the best gradation:

Metol	32 gr.
Hydrochinon	60 gr.
Sodium sulphite, cryst.	40 gr.
Sodium carbonate	80 gr.
Sodium bromide	16 gr.
Water	16 oz.

For enlargements it should be diluted with a little water. As a substitute for ammonium hyposulphite, the same writer dilutes 16 oz. of the strongest ammonia with 8 oz. of water and adds hypo until saturated, then adds 1 part of this to 4 parts of water, "to get rid of the superfluous ammonia." Then, as an alkaline fixer was not wanted, a solution of sodium sulphite was made and enough sulphuric acid added to make the solution smell of sulphurous acid, and this was added in very small quantities to the ammoniacal hypo bath. (*Bull. Phot.*, 1921, 28, 522). This certainly is a very curious waste of good ammonia. Ammonium hyposulphite would not be formed, merely a sulphite, and the solvent action of this is very poor compared to hyposulphite, notwithstanding that the writer said that he found it to work as well.

A SILVER-IRON SENSITIZER. — York Schwartz has patented a variation of this well-known sensitizer, in which silver phosphate and ferric oxalate are the sensitive salts. The method of preparation is as follows; 36 g of ferric oxalate are dissolved in 100 ccm distilled water by the aid of heat and the solution filtered; 4.8 g of silver nitrate and 2.8 g sodium phosphate ($Na_2HPO_4.12H_2O$) are rubbed up with 70 ccm distilled water until the silver phosphate settles out, and then 70 ccm of the ferric oxalate solution are added and stirred until the silver salt dissolves; then 3.0 g citric acid are added and the solution filtered and kept in the dark. This, it will be seen, has no colloid and if this addition is required it is advisable to reduce the quantity of water used for the phosphate, to 30 ccm, and in the remaining 40 ccm of water dissolve 4 g of gelatine, and add the sensitizer to the warm gelatine solution. The solution remains liquid above 10° C. (*Eng. Pat.* 175,317, 1920; *Brit. J. Phot.* 1922, **69**, 219). This particular modification may possibly possess some special features that lend themselves to better results than the usual one-solution sensitizer. There is an excess of silver nitrate of nearly 1 g and some nitric acid would also be formed, though this would tend to give a slower printing paper and tend also to reversal of the image. The use of silver phosphate is very old, dating back to 1839 by Fyfe, and Maxwell Lyte in 1856. The trouble with using this salt is that it gives very flat weak prints with no pure whites, and for this reason has never found favor. J. Meyer (*Eng. Pat.* 17,098, 1899) patented the use of silver phosphate dissolved in an organic acid, and Schwartz (*Eng. Pat.* 9,993,1902; 9,855, 1907) used it with potassium chlorate to obtain contrast. Valenta (*Jahrbuch*, 1901, 130; 1906, 150) proposed to use a collodion emulsion of phosphate which had the advantage of containing no free nitric acid, by using phosphoric acid and ammonionitrate of silver. This gave excellent results. Schwartz's paper was introduced commercially in England in 1908, under the name of Ensyna; but a brief exposure was given and then the image was developed with an acid metol developer. In the present case it would seem that the paper has to be developed with an alkaline oxalate, to dissolve the ferrous oxalate formed by the action of light on the ferric salt, so that it approaches more to the kallitype paper processes, than printing out.

CAMPHOR SUBSTITUTES — J. M. Kessler has patented the addition of benzoyl derivatives of methyl, ethyl and butyl salicylates to pyroxylin solutions in lieu of camphor, which is extremely high in price and scarce. They may also be used in conjunction with the acetyl celluloses (*U. S. Pat.* 1,408,075, 1922; *Chem. Age*, 1922, **30**, 111). The number of camphor substitutes is legion; benzyl acetyl salicylates were patented by Soc. Chim. des Usines du Rhone (*Eng. Pat.* 14,699, 1902; 17,985, 1911; *Fr. Pat.* 483,662, 1917), and by Wolffenstein (*Eng. Pat.* 27,562, 1911).

MORDANTED COLOR IMAGES — W. V. D. Kelley has patented a new method of obtaining colored images for subtractive color photography. After development and fixing in the usual way the positive is treated with a 10 per cent solution of formaldehyde, washed and immersed in the following bath:

Potassium bichromate	4.75 g	36.5 gr.
Potassium bromide	9.5 g	73 gr.
Cupric sulphate	14 g	107.5 gr.
Hydrochloric acid	10 ccm	77 minims
Water	1000 ccm	16 oz.

The image is bleached in this and then should be fixed, preferably in a hypo bath with metabisulphite. It is then immersed in a dye bath of about 0.5 per cent at a temperature of 43° to 54° C. (110° to 130° F. for about two minutes, then washed for about three minutes at 49° C. (120° F). The dyes are of the acid class, such as fast reds, blues and greens, acid fuchsin and the azo colors. An 0.5 per cent solution of sulphurous acid may be used to brighten the colors. The patentee considers that there is deposited a transparent salt of copper or of chromium, in proportion to the silver, since the image has a brown color possibly due to the silver oxide, which entirely disappears in the fixing bath, while the transparent copper compound is not affected; it is characteristic of the images thus bleached that they do not develop (*U. S. Pat.* 1,411,968). This should be a useful process, as it opens the field to the use of the acid dyes, and others of like type, which give one a far greater choice of colors than the basic dyes, which have been principally used. The acid dyes have the advantage, that they are as a rule less dichroic, that is to say they show the same hue in thin layers as in thick. What the exact chemical reactions are that take place can not be stated without some experimenting. In the first place there would be formed in the solution cupric bromide and chloride, and as there is excess of hydrochloric acid probably some chlorochromite of potash, which may be the active mordant, and this assumption is supported by the fact that the bleached and fixed image is not developable, for the silver chlorochromite formed can not be redeveloped.

A UNIVERSAL DEVELOPER — E. H. Booth has worked out a developer that shall fulfill the following requirements: (a) it must not stain the emulsion, nor the fingers; (b) it must not cause chemical fog; (c) it must be easy to control, so that increase or decrease of contrast may be readily obtained; (d) it must be easy to make and capable of being stored in highly concentrated form; (e) it must keep well; (f) the time spent in making working solu-

tions must be short; (g) it must be equally useful for plates, slides, gaslight and bromide papers; (h) it must be composed of chemicals that are not expensive and are readily obtainable. These are the chief requirements, but there are others, such as freedom from frilling, etc. The following was worked out:

Metol	5.7 g	88 gr.
Hydrochinon	22.6 g	349 gr.
Distilled water	415 ccm	14.6 oz.

Heat the water to 50° C (112° F) and dissolve the metol and hydrochinon. Add:

Sodium sulphite, dry	77.7 g	1,119 gr.

Stir for 2 minutes. This will produce a greyish-white precipitate. Add.

Caustic soda, pure stick	14.5 g	224 gr.

Stir until the soda is dissolved. The white precipitate will then have disappeared. Filter rapidly and bottle. If it is intended to make the developer to last over three months, small bottles should be used to hold it. The Watkins factors for negative work are: for soft pictures 13, for normal 15, for contrasty 18. The best temperature is 16° to 21° C. (60° to 70° F.). A hardening bath should always be used if possible, but if this is not permissible then the temperature should not be over 21° C. (70° F.). The hardening bath used is a saturated solution of potash alum, but the ordinary acid fixing bath may be used. The following are the working strengths for plates and films: standard solution 1 part, distilled water 15 parts. Normal time of development 4 minutes. For stand development: standard 1 part, water 31 parts. Normal time of development 8 minutes. For bromides: standard solution 1 part, water 15 parts. For lantern slides: standard, 1 part, water 15 parts. For development (gaslight) papers: standard 1 part, water 15 parts, to which add 1 drop of 10 per cent bromide solution for soft effects and 3 drops for black and white work. The worker should test the developer for the particular plate used. For slow tank work, that is 15 minutes, 1 part of the standard should be diluted with 63 parts water and used at 18° C. (65° F.). For extreme contrast in scientific work, development is pushed until chemical fog begins, so as to get as great a range of density as possible. For line work development is pushed even more and a strong Farmer's reducer applied. For cases of known over-exposure for negatives, add 5 drops of 10 per cent bromide solution. (*Austral. Photo-Review.*)

BARIUM CHLORIDE AS A HYPO-ELIMINATOR. — Mr. Byron is reported to have recommended a 5 per cent solution of barium chloride as a hypo-eliminator, and to have stated that sodium chloride and barium sulphate are formed, two salts that are perfectly harmless. The prints are to be washed for one or two minutes and then immersed for another three minutes in the barium solution, then rinsed, wiped with a wet swab and dried. (*Phot. Ind.*, 1922, 176 from *Camera Craft.*) It has not been possible to identify the actual page and issue where this is said to appear; but all workers should be warned against the use of barium chloride for this purpose. Sodium chloride would certainly be formed and also some sulphate, but this latter would arise from the sulphates usually present in ordinary water. Any traces of hyposulphite would most certainly form barium hyposulphite, an almost insoluble salt. Its solubility in water at 17.5° C. (63° F.) is 0.2675 parts in 100. From this it is obvious that all that one does by treating prints or negatives with barium chloride is to convert the hypo into a salt that is about 2800 times less soluble. This does not take into consideration that there must always be present silver hyposulphites, and these would react with the barium chloride to form equally insoluble double salts. Barium nitrate was recommended, and proved to be useless, in 1881 and somewhere in the 90's barium chloride was also suggested in the *Brit. J. Phot.*, and I made a series of tests and analyses of the results obtained and proved it to be useless, or worse.

KEEPING FERRICYANIDE SOLUTIONS. — These, it is probably well known, are difficult to keep, and it is recommended to add to the solution twice the weight of common salt, and to keep the solutions in yellow glass bottles and in the dark. (*Phot. Ind.*, 1922, 176). One of the best things to do is to add a crystal or two of potassium bichromate to the solution and boil and immediately bottle up.

TESTING DEVELOPERS. — J. I. Crabtree, of the Kodak Research Laboratory, gives some useful hints on this subject. A standard formula is adopted, the composition of which may vary according to the ideas of the operator; but the following was adopted in this investigation:

Elon (metol)	1.25 g	18.75 gr.
Hydrochinon	3.75 g	56.25 gr.
Sodium sulphite	50 g	12.3 oz.
Sodium carbonate	25 g	375 gr.
Potassium bromide	1.5 g	20 gr.
Water	1000 ccm	32 oz.

Dissolve the sulphite in about 300 ccm (10 oz.) of water; then add the metol or hydrochinon or both, and allow to cool. Meanwhile the carbonate should be dissolved in 300 ccm of luke-warm water and allowed to cool, and the bromide added. Add the carbonate solution to the sulphite solution and add cold water to make 32 oz. or 1000 ccm. To compare developers, strip negatives are wanted and while these are usually made by exposing a plate or film to a standard light-source by means of a special rotating disk or drop shutter, there is no difficulty in making the same with any light. Take a 5 x 7 or 8 x 10 sheet of film and cut off a narrow strip, about ¾ inch wide is plenty. Place in a printing frame and make a preliminary test at a fixed distance from a light, so as to find the exposure that will just give a visible deposit when developed with the standard developer with the normal time of development. Assume this to be two seconds. Then place the whole film in the printing frame at the same distance and cover with an opaque card; shift the card so as to give 16 seconds to the first strip. Then expose new strips for 8, 4, 2 seconds and leave one strip unexposed, as this will show the amount of fog produced without exposure to light. The film will then have received a series of exposures of 32, 16, 8, 4, 2, 0 seconds. It can then be cut up into strips and used for testing the developers. The exact ratio of the exposures is unimportant, but a ratio in the powers of 2 as above is the best. An alternative plan, which saves some time, is not to cut the film, but develop immediately after exposure and use this negative for printing from, and if the same exposure is given each time equally satisfactory results are obtained and one can make any number of tests. The exposure under the negative must be such as to give a visible deposit under the densest step, and a fog or unexposed strip should always be made. The test negative will have seven

steps, inclusive of the fog strip, and the lowest density will represent the shadows of a negative, while the highest density step will represent the highlights. The density of the second step, that is the first visible deposit, is a measure of the detail-giving power of a developer, while the difference between this and the highest step is the range of contrast. In the case of developers required to render a minimum of exposure, as for high speed photography, the difference in density between the fog strip and the second step should be as great as possible with enough difference between the second and the last steps to give a sufficiently contrasty print. With a developer intended for line work the fog strip should be as free from deposit as possible and the difference between the first and last steps should be as great as possible.

An ideal developer is one which will develop rapidly, give good contrasts and shadow detail without fog, and have good keeping qualities. For short exposures, the ideals differ from amateur finisher's and motion picture work. Here keeping power and comparatively rapid development are the main conditions. The "developing power" may be considered as made up of (a) the time of appearance, (b) the rate of development, (c) the power to render visible a minimum exposure. Developers differ considerably as regards the time of appearance of the image. Metol, paramidophenol and other developers cause the image to appear very rapidly, but the total time to attain a high density is prolonged. Hydrochinon, on the other hand, makes the image appear slowly and gives density fairly quickly. Density contrast must be differentiated from general density; an overexposed and underdeveloped negative will have good density in the shadows, but the highlights will not be much more dense; that is the whole negative will look dense but the density contrast will be small. The power of the developer to render visible a minimum exposure is the most important property of a developer, as contrast is of less moment in view of the large variety of printing media now available. The detail-giving power of a developer is estimated by the difference between the fog strip and the first step, and the greater this is the less the fogging power. Detail-giving power is usually lowered by the addition of bromide, which practically cuts off the same amount of density from each step. The relative effect of bromide is greater on the first step than on the last, and this is why it is advisable to omit bromide when testing developers. With some very energetic developers, an addition of bromide is advisable, because it restrains fog more than the image. Suppose that in 5 minutes without bromide the first visible step had a density of 0.4. and then fog commenced to form. In the next 5 minutes, suppose a fog density of 0.2 is formed and the total density of the first step grows only to 0.5. The effective density contrast is cut down to 0.3. If the addition of bromide cuts the density of the first step to 0.45 and that of the fog to 0.05, the density contrast or effective density of the step is 0.4, showing the advantage of adding bromide. The fog produced in development is less in the highlights than in the shadows, because in the former more bromide is set free. The absolute amount of fog depends on the quantity of developer, because, with a small volume of developer, the ratio of bromide formed is obviously greater than when a large quantity is used. To test a developer for fogging power, use a lantern plate or motion picture film, as the emulsions are very free from emulsion fog, but very susceptible to impurities in the developer. Immerse a plate or film, without exposure, as to one half in the developer for one minute and then completely immerse the film. Fog will appear on the immersed half before the second and the time for the dividing line to become visible is taken as the fogging point. The keeping power of a developer may be tested by exposing it in an open tray in a room, and developing test strips in the same daily, taking care to bring the volume of the solution to that originally started with. A standard developer should always be tested at the same time. A solution that refuses to develop after standing in an open tray for two or three days is useless for tank work. In the case of a developer with good keeping powers, the maximum density will usually drop to about one-half in three or four days. The life of a developer can only be found by developing strip after strip in a given volume of solution and noting the time of appearance of the image and the point at which change in color or a weakening of the image occurs. The color of the image is important when developing prints or motion picture film. In a negative it is of less importance. Pyro alone gives a colored image in negative work and the oxidized pyro stain is deposited with the silver and in ratio to the same, therefore such negatives have more printing contrast.

Dilution of a developer is sometimes desirable to secure a certain contrast in a given time. Pyro, diluted up to three or four times, behaves normally, that is, the time of development is proportional to the dilution, and the fog value approximately equal. With metol-hydrochinon the time with dilute developer up to three times is practically proportional, but there is more tendency to fog. Temperature plays an important part and with some developers, such as hydrochinon, the action is very poor at low temperatures. The more alkaline the developer the shorter the life of an acid fixing bath, and prints or negatives may become stained. Excessive alkali tends to soften the gelatine, so that a minimum is preferable. The cost of a developer depends on the total area of sensitive surface that can be developed; and a developer that costs more to make but lasts longer is cheaper, in the long run.

The following is recommended for underexposed negatives:

Sodium sulphite	60 g	2 oz.
Elon (metol)	16 g	250 gr.
Hydrochinon	16 g	250 gr.
Caustic soda	10 g	150 gr.
Potassium bromide	10 g	150 gr.
Water to	1000 ccm	32 oz.

Then add wood or denatured alcohol 50 ccm.

The best contrast developer known is:

A

Sodium bisulphite	25 g	375 gr.
Hydrochinon	25 g	375 gr.
Potassium bromide	25 g	375 gr.
Water to	1000 ccm	32 oz.

B

Caustic soda	45 g	1½ oz.
Water to	1000 ccm	32 oz.

For use mix in equal parts. This is inferior in keeping power to the Eastman process developer for tank work. This latter is:

Sodium sulphite	75 g	2½ oz.
Elon	1 g	15 gr.
Hydrochinon	9 g	135 gr.
Potassium carbonate	25 g	275 gr.
Potassium bromide	5 g	75 gr.
Water to	1000 ccm	32 oz.

For an ultra rapid developer for recording paper, as used in many scientific instruments, when it is necessary to develop almost instantaneously, the following is recommended:

A

Sodium sulphite	15 g	225 gr.
Elon	10 g	150 gr.
Hydrochinon	10 g	150 gr.
Sodium sulphite	60 g	2 oz.
Water to	1000 ccm	32 oz.

Then add wood or denatured alcohol 50 ccm. The sulphite is added in two portions to facilitate solution of the metol.

B

Caustic soda	25 g	375 gr.
Water to	1000 ccm	32 oz.

Mix in equal volumes. (*Amer. Annual. Phot.*, 1922:)

SKETCH PORTRAITS — Namias suggests the following method of making these. Coat the glass side of the negative with a varnish made of a 5 to 10 per cent solution of gum dammar in benzol, and add enough of the oil-soluble yellow or red aniline dyes to prevent the image from printing through. Allow the varnish to dry thorcughly, in fact it is as well to heat the negative for a short time. Support the negative on a retouching desk, glass side to the operator, and with an awl or needle scrape off the varnish from the contours of the face, hair, etc., or any parts that are desired in the finished print (*Phot. Ind.*, 1922, 266). The oil-soluble dyes are usually known as Sudan dyes, and it is advisable to use a mixture of the red and yellow, as the former as a rule let through some blue light that prints.

STAINING BRASS — Though the following is not new it may be useful. In order to give polished brass a steel-gray color immerse in the following mixture:

Antimony sulphide	50 g	10 oz.
Sodium carbonate, dry	120 g	2½ oz.
Water	800 ccm	16 oz.

Boil and while still hot filter out the precipitate. This precipitate is known as Kermes mineral, or sulphurated antimony, and can be obtained commercially, thus saving this first step. Then mix:

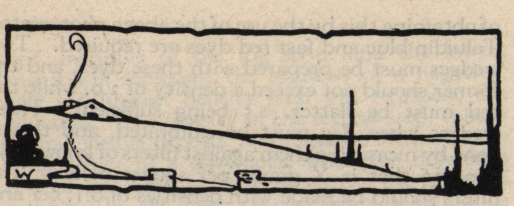
Kermes mineral	12.5 g	96 gr.
Cream of tartar	12.5 g	96 gr.
Hypo	25 g	192 gr.
Water	1000 ccm	16 oz.

The metal must be free from grease and should be dipped into the hot solution and dried. Or the following may be used:

Ferrous sulphate	83 g	637 gr.
Arsenic acid	83 g	637 gr.
Spirits of salts	1000 ccm	16 oz.

Heat to 70° to 80° C. (158° to 176° F.) until the arsenic dissolves. Spirits of salts is the impure hydrochloric acid. This solution is intensely poisonous and it is better to leave it in a warm place until the arsenic dissolves, as the arsenic is very volatile. It is better to leave it alone altogether. The brass should be repeatedly dipped into the cold solution, until the desired color is obtained, then well washed. Needless to state this attacks solder at once. (*Phot. Ind.*, 1922, 304).

ARTIFICIAL DAYLIGHT — Naumann suggests that for colorimetric work a white light, comparable to daylight, is required, and the following is his method of obtaining this by the use of the above photometer. Toluidin blue and fast red dyes are required. Two wedges must be prepared with these dyes, and the former should not exceed a density of 2.0, while the red must be flatter, 0.5 being sufficient. These wedges when dry must be calibrated, and this is done by measuring them against filters of known dye density, that is X grams per square meter. The filters should be made with densities of 0.1, 0.2 and 0.3 for the red, and for the blue the same three density filters and also two with 1.0 and 2.0 respectively. In order that the gelatine shall not run off the glass, which must be the whitest plate glass, he suggests the following clever little dodge, namely wiping the edges of the glass with a small piece of plasticine, which leaves a narrow greasy line over which the gelatine will not flow. Of course, if this is done, the actual area of the glass within this margin must be carefully measured, so as to obtain the exact area of the filter surface. The wedges, when dry, should be varnished to protect their surfaces. To calibrate the wedges, one of the filters should be placed on L^2 and the corresponding colored wedge on L^1, and the wedge shifted till the two object fields match, then the edge of the colored wedge, which should bear a paper strip, should be marked with the dye density. This operation should be repeated with all the filters, and it is clear that by superposing two or more of the filters far more readings can be obtained. Naturally this neglects the absorption of the light by the glass and the gelatine, but this can be ignored in practical work. If it be considered necessary to compensate for this, then obviously a like number of the same glasses, coated with like quantities of plain gelatine solution, can be placed over the wedges; but this is an unnecessary refinement. It is frequently difficult to judge of the matching of the fields with the finer dye densities, and this is facilitated by using filters over the eyehole; thus when calibrating the blue wedge, a medium rose Bengal filter should be used. For the red, a toluidin blue filter of from 0.5 to 0.1 may be used. When both wedges have been calibrated, one may proceed to determine the composition of a white light against any artificial source. The two wedges should be superimposed on L^1; it is better to reverse the ends of these, that is place the dense edge of one against the thin edge of the other. L^2 should be illuminated by the light to be matched, and with daylight it should preferably be reflected from white paper, such as stout blotting paper. If extreme accuracy be required, than a block of compressed magnesia, which can be obtained from any drug store, should be used, and the surface should be smoothed off with a sharp knife. The wedges are now shifted till the two fields match and the readings of the wedges will give the composition of the necessary filter to bring daylight to the artificial light and vice versa. Naumann states that he found, with a metal filament electric lamp and 6 volts overrunning, that toluidin blue 1.65 plus fast red 0.25 was required. For the old carbon filament lamp, blue 2.10 plus red 0.33 were required. It is obvious that any light may be converted into daylight in this way, and it would thus be possible to find the necessary filters to use for screen-plates with any light source. (*Zeits. wiss. Phot.*, 1922, **21**, 186). It will be found extremely easy to judge of fine differences in color by using in front of the eyehole a complementary colored filter, that is to say a yellow for the blue and a green for the red. These complementary colored filters absorb the colors and produce grey, which is very easy to read against the colored light.



LOCAL MANIPULATION

I once promised myself that I was never going to get old, but lately I have had misgivings. Of course, when I say old, I mean old in spirit, for there is not much chance to avoid having an extra year plastered onto one about every so often. That kind of age is pretty hard to sidestep.

The thing that has made me uneasy is to see myself losing certain youthful attitudes of mind.

Take for instance my attitude towards the female of the species. Formerly, when she called me by name from the other end of the house, I used to be hugely annoyed that she didn't also sing out what she wanted, and now and then I would merely bellow back, "What is it!" But I find that I have changed. I either smile indulgently and go see what is up, or else gently shut the door and make believe that I haven't heard. In other words, instead of starting a row I either go to her or make her come to me. And that's an *old* dog's trick.

But the thing that worries me most is that I have grown so easy on others. For instance, there is the man who cuts the grass. I used to cut the grass myself, so know something about the speed with which this job can be dispatched, but instead of being indignant at the way this hireling soldiers at the mower, I find myself amused at his pretense of working like a steam engine.

"Suppose you were slipping yourself," I reflect. "Would you be happy at such a job!" So the man gets his money, and I leave him his peace of mind.

I find this same weak-kneed philosophy creeping in on other things. An amateur shows me his pictures. They are punk. Once I would have told him so, and why. But now I catch myself thinking, "Why spoil his day! He has not your experience, your standards. Be easy on him." So I get him to talk about them himself, and then he forgets to ask for a judgment. Or I suggest certain other arrangements or new subjects he might try.

Why can't I jump right in, the way I used to, and set everybody right! I fear the marks of age are creeping o'er me.

Nevertheless, one idea is as strong with me as ever and that is the friendliness of picture-making as an avocation. This idea is so well brought out in a letter from one of the finer (I long ago learned it is not the weaker) sex, that I am quoting it here entire, to wit:

"When you proposed the question as to whether a camera can serve any other purpose than to give a record of picnics and parties, of houses and friends including the babies and older children, you evidently set a good many of the readers of AMERICAN PHOTOGRAPHY to thinking. At any rate, my own desk has yielded, from its forgotten recesses, the notes made long ago, when the subject first came up. They give no very new view-point, and may not be helpful, but such as they are, I am moved to send them.

"At first my answer was that my best pictures are more than records, but on further thought it developed that they are, rather, unusual records or at least unusually successful ones, often proving to have a further use, even when the only reason for taking them was the common one of 'getting a print for the album.' On the other hand there are some pictures that have been taken solely because of requests that have come, sometimes from comparative strangers. As an example of such pictures, the ones sent to a Red Cross nurse, while she was overseas, showing her father and mother in the home surroundings, come to my mind. The purpose of those was decidedly more than to get a record, and the result for myself has proven most worth while, for now that the nurse has returned, a friendship has grown up between us, which must have been much hastened in its earlier stages because she knew that at a busy time I had taken thought for her when we had scarcely met.

"My camera furthers my friendships, then, both by helping to make new acquaintances, and by helping me to keep in touch with those far away. Over and over this happens. Two college classmates, each a mother of charming children, live near enough for occasional pictures of the babies. We would have much less in common, if it were not for the contributions I can make to their baby-books. And within a short time, I have had two letters, one from a playmate from whom I was separated at the age of twelve, and the other from a cousin in Hawaii, each of the letters illustrated, as our custom is, with three or four prints. Perhaps neither of these girls would be writing me if it were not for the pictures, for we are all interested in the printing, and much of our correspondence is concerning ways and means for improving our methods.

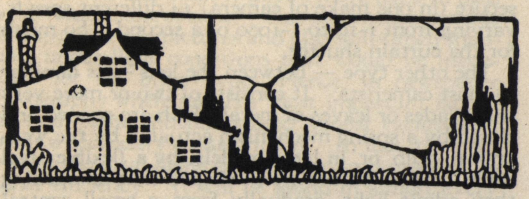
"As a teacher, my camera has made it possible for me to do some things for the school that others could not do. A set of record pictures, showing our new building in various stages of progress, pictures of the school gardens and green-house, or the teams in basket-ball, track, and other branches of athletics, and pictures taken on the auditorium stage, after the plays given by the students, with the stage lights sufficient for making the exposures, are some of my achievements. Then, too, at times the students have learned to do their own printing, and have studied the subject of light and that of lenses, with the camera to illustrate. It is a wonderfully interesting way for a physics class to learn an application of conjugate foci by means of an ordinary daylight enlarger, which may be taken into the classroom and before the end of the recitation a finished enlargement may be developed before the class!

"Some time ago, when I had a class of nine-year-old boys in sunday school, they were surprisingly aided in regular attendance by the simple means of taking a picture of all who had been present for six weeks in succession, a small print being given to each, with the promise of another group picture at the end of the next six weeks, or a postcard enlargement of the first if one had been in both. We even presented a 5 x 7 to a few who were very faithful for a whole year.

"That Christmas presents are often provided by the camera, all who make enlargements, and some who do not, know. I have given the two girls who are corresponding and camera enthusiasts, frames like my own, which have movable backs, and will hold prints of various sizes, with cutout mats for the smaller ones. They usually receive enlarge-

ments for the frames each year.

"If it is true that doing something for somebody is the surest way to happiness, then the camera is a first-class aid to happiness. Surely I have found it so."



SKETCH-BOOK LEAVES

PROFESSIONAL ASSISTANCE

A question which has lately come in for a good deal of discussion among professional photographers is that of making more out of the relation now existing between the amateur and the professional, if it may be said that any relation at all exists between them at present. Here certainly is a fruitful subject for consideration, one in which the amateur should be even more interested than the professional himself.

If we were not so used to it, we could not help being struck by the fact that photography, so far as concerns the variety of people interested or engaged in it, is a pretty mixed-up affair. No apprenticeship is necessary to take pictures with success, although to make a living out of taking them requires not only an apprenticeship, but a fair degree of business ability and generally some capital. Everyone is conscious of a dividing line between the amateur and the professional, and yet the only satisfactory line which it has been possible to draw between the two is one of motive, it being explained that the amateur makes pictures for the enjoyment he derives from so doing, while the professional make pictures for a living. Nevertheless, although there are a good many amateurs who are as skillful and proficient as the average professional, the thing that clearly and rightly distinguishes the professional from the amateur in the public mind more than anything else is the general truth that the professional knows thoroughly what the amateur knows only in some slight degree.

In this situation, it is urged that the professional help the amateur to improve his results.

Some professionals object that if they do this they will merely lift the amateur up to their own level and thereby make themselves less necessary than at present. Why give away the advantage which is their own bread and butter?

The present writer can understand this attitude, but he does not agree with it, for the reason that it runs counter to the history of progress in all lines. Obstructionist practices inevitably fail. They are generally a rather stupid effort to protect a weak position, which cannot be improved in such a manner no matter what is done. The writer's own attitude is that the matter should be viewed without prejudice, to see if it has possibilities of profit. If the professional is doing a good business on his present basis and cannot afford to bother with the amateur, as is often the case, well and good, but otherwise he oughtn't to fill his mind with foolish thoughts about putting himself out of business by helping amateurs to make better pictures.

The trouble with a great many people is that they can see opportunity only if clad in familiar garb. They can gauge the opportunities in medicine, law, dentistry, and other professions, because it has all been worked out nicely for them by the experience of others. A grocery salesman can make so much, a haberdashery salesman can make so much, an automobile mechanic makes so much, the average chemist's income is so much, and so on. To be this or that or the other thing you do thus and so, and you make so much money. The rules have been all worked out. Follow them and you will succeed.

To my mind, this is deathly, also un-American. It puts everything on a sort of occupational caste system. You don't find the newcomers to our shores settling down to any such play-safe program, and that is one reason why so much of the nation's wealth has passed into their hands. Nor is it the system on which have been built the substantial fortunes which are pointed out. How could it be? When one puts himself in the play-safe class, following closely in the footsteps of others, he puts himself in competition with the crowd, and that is sure to limit his returns.

It seems pretty clear that there is a new opportunity for the professional photographer today if he wants to specialize in service to the amateur. Certainly the need of such service exists, and those who supply it should be able to profit thereby in exact proportion to their own resourcefulness and energy.

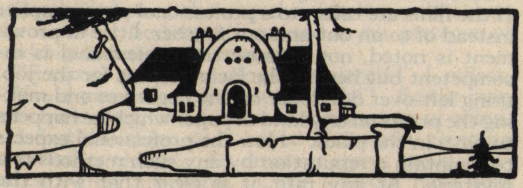
One reason why there is a commercial opportunity in such service is that the average quality of amateur finishing is exceedingly low, so low that amateurs who have been in the habit of doing their own work complain that it is almost impossible to get as good work done for them by others, regardless of the price. If the films are taken to a professional photographer instead of to an out-and-out finisher, little improvement is noted, not because the professional is incompetent but because he lacks respect for the job, using left-over developer on the negatives and making the prints on any kind of paper which he happens to have in the place. How the professional expects to maintain a reputation by any such methods is a mystery. At any rate, it is clear that with the present low grade of amateur finishing, there is an opportunity in every locality for some professional to build a reputation on expert work of this kind, charged for on a basis of quality instead of attempting to meet the rates of some cheap-skate who ought to be shot at sunrise.

Further, present conditions are such that the average amateur of today needs more help than did we who learned to make pictures a decade or two ago. This is because he is busier, or thinks he is busier, than we were in our spare leisure hours, and therefore will not give the time that we have given to developing and printing, thus shutting himself off from learning many things which we learned as a matter of course. What we gradually discovered in regard to lighting, exposure, composition, trimming, and a host of other technical details, simply because we dug into photography a good deal deeper, he must be shown by someone who knows the rest of the game; and who is better situated to do this than the professional photographer in his town or neighborhood? Far from lifting him to a position of rivalry, such assistance cannot do otherwise than to give the amateur a greater regard for the professional and a greater dependence upon him; at the same time, by the encouragement gained, giving the professional more business from this new source.

It should not make much difference to a photographic expert whether he makes his money from a more or less stereotyped style of studio portraiture at so much a dozen or from proving himself resourceful in performing photographic service of a more varied character which the public is unquestionably in need of. The main thing is to get in the money.

From what has been said the reader may assume that most photographers are unwilling to help the amateur, but this is not really true. The situation is rather that most photographers have neglected the amateur, not imagining that they had anything to gain by reaching out for his favor. As a matter of fact, there are few professional photographers who are not glad to help the amateur when he comes to him with his questions, and to perform various special services for him if asked to do so, such, for example, as making enlargements and serving up the amateur's favorite prints in special mountings.

The writer owes much to the fact that he early formed the habit of scraping acquaintance with professional photographers whenever he found the opportunity to do so, and it has often seemed to him that the amateur who is starting out today cannot do better than to seek the assistance of the professional in his neighborhood in his efforts to improve. He also feels that the professional can learn a great deal from the amateur, for while the professional is by necessity restricted in the scope of his activities with the camera the amateur makes pictures everywhere and is also a pretty fair reflection of the public attitude in regard to photography. The professional needs some means of keeping in touch with the public attitude, for, working in a corner as he does, there is always a danger of his growing out-of-date.



THE QUESTION BOX

WINNING ANSWER TO JULY QUESTION

Wherein is a curtain or focal-plane shutter more efficient than a between-the-lens shutter?

The efficiency of a focal-plane shutter as compared with the between-the-lens type is analogous to the efficiency of a fast lens as compared to a slow lens. With a curtain shutter we obtain more light in the same amount of time.

To explain this for the average reader I believe it will be best to assume that he is not acquainted with the principles involved. In this way it will be easier to proceed to the vital point.

The curtain and focal-plane shutter is self-describing. It *is* a form of curtain and it moves in the focal plane, or at least near enough to it to give it the name. This curtain, a thin, strong, opaque cloth affair, is wound on a spring roller quite similar to that used on a window shade and is drawn rapidly past the face of the plate or film. Across this curtain at different intervals horizontal slits are cut, varying in width from 1-8 to 1¼ inches. There is also one opening the full size of the plate to provide for time exposure. By mechanical arrangement, any one of several slits may be drawn past the face of the plate, and the speed of its motion is predetermined by the tension put on the spring in the roller. From this brief description it can be seen that exposure will vary according to the size of the slit used and the speed at which it travels past the sensitive emulsion. With four slits and six tensions we secure (in one make of camera) 24 different speeds, varying from 1-10 to 1-1000 of a second. So much for the curtain shutter.

The other type — between the lens — is familiar to most camerists. It consists of two or more very thin blades or leaves of metal which are opened and closed by a spring mechanism actuated by the well-known 'bulb' or, in later models, by a flexible steel cable. These blades are so shaped that on opening they admit light gradually from a small central point to the full opening of the diaphragm. On closing, the effect is reversed.

Now let us make an exposure with each shutter and compare the operations. Suppose we set each for 1-25 of a second at *f*:8. What does this mean? It means that every point on the plate should receive light for an interval of 1-25 of a second and this is essentially what happens. But with the former type the plate is exposed in successive horizontal elements from top to bottom at full intensity, while the latter the plate receives a gradual exposure over its whole surface from the very weakest to full intensity and back again. We have exposed both plates for the same length of time but it can be shown that the *amount of light* is about 1-3 greater with the focal-plane shutter. We have not space here, however, to go into the mathematics of light necessary to prove this fact. Suffice it to say that this advantage is the main factor in the curtain shutter's efficiency. Another point is the accuracy of timing which we can obtain with this type and the lack of fine delicate parts to get out of adjustment. Between-the-lens shutters are very sensitive to foreign particles; they are usually slower in speed than their markings indicate, and it is known that their operation is affected according as the camera is held in the vertical or horizontal position. (True of pump shutter only. — Ed.) Another advantage of the curtain shutter is that it admits of the use of a mirror for direct view finding.

One may ask why we use different-sized slits; why not one slit and more tensions or vice versa? A few figures may help to show that the combination of several openings and several tensions serves to satisfy an economic requisite. Take for instance the smallest slit — 1-8 of an inch — and assume that we wish to make an exposure of 1-1000 of a second. With a 4¼ inch plate we can find the time required by the curtain to make the exposure by dividing the number of eighths in 4¼ by 1000, or approximately 1-30 of a second. But assuming only this one size opening we find that to make an exposure of 1-10 of a second our curtain would require 3 seconds to make the passage, which would be mechanically difficult to obtain accurately and prohibitive except on a tripod. Going to the other extreme, to make a 1-1000 of a second exposure with a 1½ inch slit would require our curtain moving at the rate of 1000 feet per second. With one medium-sized opening we would still be obliged to have 24 different tensions and this would involve an elaborate mechanism as well as extra work on the part of the photographer.

On the other hand one tension and 24 openings would necessitate a curtain over ten feet long. So to sum up matters we must have our curtain cover the plate quickly enough to enable us to hold the

camera and yet not with a speed sufficient to set fire to the film. Four different openings and six tensions answers the requirements quite satisfactorily.

In conclusion, the focal-plane shutter is more efficient than the between-the-lens type because, with identical lens and stop, it allows more light to pass in a given amount of time. This fact makes possible high-speed action pictures and also well-timed snapshots under light conditions that would be inadequate for the other type. Hence, in newspaper photography where *time* is a most important factor, the focal-plane shutter is used almost exclusively; cost is a secondary consideration. In fact, the high price of the focal-plane shutter is a good proof of its higher efficiency. It will be found in almost every kind of machine that as its efficiency progresses in arithmetical ratio its cost will mount up in geometric ratio. — GEORGE A. BEANE, JR.

Practically speaking, a focal-plane shutter does anything which can be done with or by a between-the-lens shutter. Then add to that the fact that it is a part of the camera and not the lens and you have an advantage quite important. Change to any lens and you can still use your curtain shutter, be the lens old or modern, and it need have no shutter to serve its purpose. I have even used a lens which once had old Waterhouse stops. — E. F. JONES.

OCTOBER QUESTION FOR READERS

What would you give as the four most important rules for success with indoor pictures? Explain your selection.

For the best answer to this question received by November 15 a credit of $2.00 towards books of our publication will be awarded. Address the Question Box Editor, and please write any other communication on a separate sheet of paper.

READERS' CRITICISMS

BEST CRITICISM OF PRINT NO. 31

Had Euclid been an art critic, he would never have uttered that monumental falsehood: "A whole is greater than any of its parts." Here we have his statement refuted so far as pictorial composition is concerned, for any of the five component parts, isolated and enlarged, would be more artistic as a portrait than the whole is as a group. Yet even at that, the group is as good as those turned out by many professional photographers.

Laying over each of the heads in the picture a sheet of paper in which has been cut a hole 5-8" by 7-8" one sees a miniature portrait, well lighted, and evidently expressive of the character of the sitter. In each case, the included portion of the background is objectionable because of the attention it must receive. In a cursory view of a picture, one should be unconscious of the background. If a pencil were used here on the negative, it might have the effect of oil on the troubled waters.

Now the only objection to this type of group is that people do not gather in bunches and sit there doing nothing and obviously saying nothing, and in all probability, thinking very little. Or rather they do it only when in front of the camera. Hence there is bound to be an element of unnaturalness.

May I hazard the opinion that a less uniform disposition of the sitters' hands would lend pleasing variety to the arrangement; and that the amputation of the feet of one of the sitters, and the toes of another, might have been avoided by dropping the lens a trifle!

I suspect that this group was made on the porch of the childhood home of the ladies. To them, to the maker, and to other relatives and friends, then, it has an integral relation to the theme. To the casual observer, not so; he finds the mass of clapboards and shutters on one side, the recessional of pillars on the other, and most of all the nondescript horizontal black line against the inconsequential white rectangle in the middle background, together with the other white rectangle in the upper right-hand corner, rather confusing. His eye, like Emerson's snow, "seems nowhere to alight."

Yet I fail to see in this picture, any reason for "going the limit." I suppose we all make prints of this kind. We know they are not art; when we get into a discussion with someone whose opinion we cherish, we are very careful not to call them pictures; but we continue to make them — at least I do; and with all due deference to pictorialism, I'm going to continue. Why! Simply for this reason: I have some friends whom the Lord gifted with the best hearts he ever planted in human bosoms. But they don't care a whoop about art. When I show them a print with lines and masses worked out to the best of my poor ability, they are polite and look at it, but pick up some snapshots of execrability inexpressible and go nutty over them. These friends of mine like to be taken. But I — assuming for the nonce that I had the artistic ability — could try till doomsday and not get them to pose for an artistic figure study or group. Well, I'm going to keep on taking this kind of picture because they like them. Says J. G. Holland, "Wings are for angels, but feet for men." I like to essay artistic subjects, but in this man's town I'd be lonely, so lonely. And I like company — and variety. — BERT LEACH, Portsmouth, Ohio.

OTHER CRITICISMS

Starting at the left:

Figure 1 looks comfortable and not self-conscious.

Figure 2 watching the manipulation of camera and so not interested in the group.

Figure 3 gazing far off from the matter in hand and not comfortably seated (apparently) and surely not "tied into" the group.

Figure 4 also watching the camerist from the corner of her eye.

Figure 5, head tipped too low and eyes glancing up from under the lids. Hands and arms in bad position.

A little re-arrangement of the group — interest in each other not in the picture, should result in a most pleasing picture with such good material at hand.

Here is my idea:

Figure 1 "as is."

Figure 2 above and slightly back and much closer to figure 1.

Criticism Print No. 31

Figure 3 with body turned sideways and facing three-fourths front.

Figure 4 one step down and in front — perhaps an arm resting on Figure 3's lap — but kept in focus.

Figure 5 with body turned away from camera — possible profile — hands possibly occupied with plate of candy, as they seem in the way.

Any way to "tie in" the grouping. — E. F. JONES.

In looking at the data accompanying this picture we find two things worth noting. One is the cheerful optimism of the maker in submitting for criticism a picture of a whole group of people, even though he qualifies it somewhat by saying that they are his sisters anyway. The other point is that the exposure was made on a dull day. By turning to the picture we may see at once that it is much better than it would have been had the sun been shining brightly. The sitters appear to be quite at ease and there are no harsh shadows.

The most serious defect appears to be the lack of unity caused by the diverse attitudes of the subjects. By seating them in chairs on the lawn there would have been much more opportunity for choosing the viewpoint and more satisfactory grouping. We would preferably place the two ladies with white waists near together. At the same time we would try to avoid having so many heads near the skyline. A little more care in regard to posts, etc., growing out of heads would be in order also.

On the whole we would regard the picture as being fairly satisfactory. A little more naturalness and a little less "assembly" and it would be very good.— RALPH BEEBE.

In my estimation an outside picture should as far as possible convey the effect that the subjects are in no way whatever posing for the picture. Now in this picture you have them all looking in practically some different direction, which is not generally the case in a group of women sitting out on the porch together.

A thing I think would have helped your picture wonderfully would have been to have them doing something, or at least have something in their hands. As it is, too many of them just seem to have their hands folded up. Although the reproduction is exceptionally bad in my paper, I think I shall have to give you credit for having good lighting on all your subjects in the group.

The lady on the extreme right of the picture seems to have her head down too low and seems too intently looking at the camera or the man taking the picture. — A. L. ELLIS.

Facing a camera lens seems to be a terrible ordeal for most humans. Apparently the subject imagines that a great effort of some sort is necessary and in his endeavor to comply with this terrifying, though imaginary, requisite he succeeds in registering an expression which otherwise he never exhibits. The female of the species is not exempt, as the print for this month shows, but I use the masculine pronoun to avoid grammatical difficulties.

It might prove interesting to consult a psychologist on this matter and learn just why the camera's eye causes the (sometimes ludicrous) facial expressions it so often does. Each one of these ladies knew the picture was going to be taken and each in turn endeavored to look natural, but I doubt if any one of them is satisfied with the result. Why!

There is also evidence that the photographer posed them so as to obtain the profile, half and full face portrait. This is commendable on his part, and was successful too. But how much more pleasing if he had made a genre out of the group. He could have had the women sewing or conversing — anything, just so they were not so manifestly conscious of the camera.

Regarding less important details, the group is crowded by the side and lower borders; and the porch pillars, yielding a series of diminishing perpendiculars, are anything but pleasant.

The data state that the picture was made on a

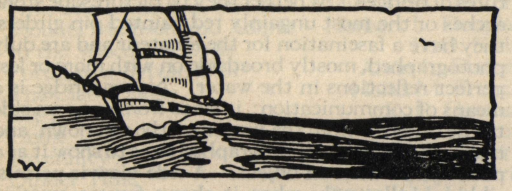
New Criticism Print No. 34

dull day; that accounts for the flatness in lighting. Technically speaking the work was successful. — GEORGE A. BEANE, JR.

NEW CRITICISM PRINT NO. 34

New criticism Print No. 34 was made with a 2½ x 4¼ film camera, the exposure being 1-25 second at *f*:6.3 on a wet afternoon in August — time about 3 P. M. What do you like about it? If you think it does not quite "get over," what reasons would you give? Does the print give you any suggestions for your own picture-taking?

For the best criticism of this print received by November 15, a credit of $2.00 towards books of our publication will be awarded. Please write on one side of the paper only, and address the Readers' Criticism Editor.



OUR COMPETITIONS

LITERARY COMPETITION

It has been our annual custom to hold a literary competition, and as this has brought us in the past a number of practical articles, we are repeating our offer this year. For the best article on a photographic subject, whether technical or inspirational, submitted to us before November 15th, we offer a prize of $35.00. We will purchase any other articles submitted which we can use, and we have usually bought about half the articles sent in. The manuscripts must be typewritten, illustrations should be kept to the minimum and diagrams should be drawn in ink neatly enough to be reproduced.

OUR ANNUAL COMPETITION

We publish in the advertising pages of the current issue formal notice of the conditions of our Third Annual Competition in which as usual cash prizes amounting to three hundred dollars and honorable mentions of lesser value are to be awarded. We hope that our readers will be liberal in the selection of their best prints for entry in this competition, for we expect to continue the practice of the past two years and send the prize-winning prints and a substantial number of the honorable mention prints on a tour of camera clubs throughout the United States We feel, and have had our opinion confirmed by competent critics, that the standard of the collections exhibited as a result of this competition in the last two years has been very high and that these exhibitions have given pictorialists and lovers of art in many places throughout the United States the opportunity to see a really representative collection of modern photography which, if it did not attain the standard of one of the international salons, still included enough work of salon standard and by salon exhibitors to show pictorialists what is regarded by judges and juries as high class modern photographic work.

We would like to reproduce here a few of the great number of enthusiastic letters which have been sent us by those who have seen these shows, telling what has been their effect on their community and the enthusiasm which has been aroused by them. It seems to us that the help which has been given pictorialists in the smaller towns by seeing these pictures has been sufficiently great to justify us in asking salon exhibitors to send us prints of salon quality for inclusion in the next competition and exhibition.

The 1922 prints were, or will be before December first, exhibited in the following places: New York City; State College, Pa.; Wilkes-Barre, Pa.; Worcester, Mass.; Boston, Mass.; Portland, Me.; Oakland, Cal.; San Diego, Cal.; San Francisco, Cal.; and Sacramento, Cal. Thus it will be seen that photographers from coast to coast have seen these pictures and we hope to arrange a similar schedule next

year. If our friends of the camera clubs who would like to see this exhibition will let us hear from them at an early date, we will endeavor to work out a schedule which will cover as many places as possible. We would suggest that two weeks be the maximum time for exhibition, as it is necessary to allow on the average a week or more between exhibitions.

SENIOR COMPETITION

The first prize in the Senior Competition was awarded to D. J. Broderick for his portrait entitled "Child Study." The technical problem presented by this was a rather difficult one owing to the large amount of white in the dress and hat. This problem is well solved by means of proper exposure and, consequently, the values in the flesh tones are well preserved and a well modeled face is the result. The expression is very charming and the portrait is one which would undoubtedly please the parents of the child exceedingly. The hands are not as well rendered as they should be, for the arrangement would have been more graceful if the thumbs had not been so obtrusive. The hands form a balance at the bottom of the print and could not be removed without impairing the composition. This is a home portrait made with a 5 x 7 View camera fitted with an 11½ inch Verito lens. The exposure at 2 P. M. in June in Connecticut in bright light was ½ second at *f*:6. The Seed 30 plate was developed in pyro and the print was made on Artura Carbon Black D.

Whoever has ascended the spire of a cathedral or some other tower in one of the old European cities must have been impressed with the picturesqueness of the long rows of steep, red-tiled roofs with one, two or more rows of dormer windows which in the South German cities with their extremely high and steep roofs sometimes occur in as many as six or seven rows. Such a scene is extremely picturesque largely because of its color, but also because of the fascinating criss-cross of the lines. The temptation to photograph it is irresistible but the results, on account of the color, are not always as interesting as the print by Mr. Warren R. Laity entitled "The City Below." The lines and masses here are very well balanced and the composition is pleasing as well as interesting. This was made from the tower of the Strassbourg cathedral with a Butcher 3¼ x 4¼ Carbine camera fitted with a 4½ inch Goerz Dagor lens. The exposure at 3 P. M. in September in strong light was 1-25 second at *f*:11 without a filter. The Agfa roll film was developed in pyro and the enlargement made on Artura Carbon black smooth E.

The third prize was awarded to Juventino Ocampo of Pachuca, Mexico for one of a series of extremely interesting and charming pictures of a baby playing with various toys. The most fascinating thing about this print is the air of eager excitement of the child who is diverted from one toy by the introduction of another and more human one. This was made with a Press Graflex camera equipped with a 10 inch Zeiss Tessar lens. The exposure was 1-10 second at *f*:4.5 using a 500 W Mazda Lamp. The Eastman film pack was developed in pyro, and printed on Azo F.

Honorable mentions were awarded as follows:

In the Garden	J. H. Field
Dugan	Herbert J. Harper
Eva	Walter E. Owen
The Suppliant — A Study in Japanese Flower Arrangement	Walter Rutherford
Portrait of Mrs. Sweet	Mrs. Sterling Smith
Marbles	Henry T. Stephenson
Awaiting Orders	John C. Stick

Commendations were awarded as follows:

The Winding Road	Lawrence Baker
Down-Town	F. E. Bronson
Ye bloom on many a birchen slope, In many a dark pine glen	Edwin B. Collins
Frederick & Blanche	Fred E. Crum
Bernice	Alec C. Fawns
Through the Autumn Woods	Wm. H. Finch
The Old Home	Jared Gardner
The Camp Fire's Spell	Chas. T. Graves
Night Watchers	Paul E. Guillot
Dreams of Adventure	C. M. Harris
The Tarantula	C. A. Heald
The Surf	Jiro Ito
The Stone Bruise	J. W. Jeffers
Their Morning Meal	E. Everett Jones
Miriam	W. Kitchen
The Bed-Time Story	Leo Kraft
Wall Street	Geo. Miller
Home Portrait of Miss S	Alex. Murray
Winter in the Hills	Louis R. Murray
Even Tide	Julien J. Proskauer
The Hunter	Arthur Reed
Craw-Fishing	H. B. Rudolph
Lanterns at a Temple	Sotaro Saba
Irresponsibility	J. H. Saunders
At the Fountain	G. W. Schinkel
Youthful Spirits	J. A. Singler
The Woodsman	Edgar S. Smith
Resting	P. F. Squier
A Quiet Harborage	Jas. Thomson
A Denizen of the Farm-Yard	F. A. Tryon
The Raft	Scott Walker
Oxford Harbor	B. M. Whitlock
Call of the Wild-Wood	A. S. Workman

JUNIOR COMPETITION

A bridge seems to be a favorite subject for photography with almost every user of a camera. Whatever the fascination of it may be, we do not think we ever saw an amateur album without several pictures of bridges. Whether they be picturesque stone arches or the most ungainly red painted pin girders, they have a fascination for the amateur and are duly photographed, mostly broadside on with more or less perfect reflections in the water. Now a bridge is a means of communication; it leads from our own side to the other — from the known to the unknown, and it should always be photographed so as to show it as a path rather than an object. A side view is permissible, usually, only when it shows figures crossing the bridge.

Mr. C. V. Hewitt in his print "A Cool Retreat" approaches his bridge in the proper spirit. He shows it as a path to an unknown region beyond and puts in a figure waiting for someone to come down that path; so we have a double mystery — the mystery as to where the path goes and the mystery as to who is coming along it. The result is a picture which is not only attractive in itself because of the beauty of the objects which exist in it, but which also gives the imagination a fillip and makes us leave the picture with a thought which is unsatisfied. This was made with a 3¼ x 5½ Compact Graflex fitted with a 7¼ inch Verito lens. The exposure at 10 A. M. in August in Michigan in hazy sunlight was 1-20 second at *f*:4. The Standard Polychrome plate was tanked

in rytol and enlarged on Wellington Bromide Cream Crayon.

The second prize was awarded to Mr. J. Sitek for his print entitled "Le Remouleur en Panne." Here is an interesting snapshot made doubly interesting by its attractive architectural background. There is a subtle humor in the title, for the technical term *en panne* is that which is regularly applied to an automobile which has got in such difficulties that its operator has to roll up his sleeves and get to work. The application to the knife-grinder's rolling machine is a descent from the sublime to the ridiculous. This was made in Lyons, France, with a 6½ x 9 cm Reflex camera fitting with a 135 mm Zeiss Tessar lens. The exposure at 11 A. M. in June in bright light was 1-12 second at *f*:4.5. The color ortho plate was developed in pyro and an enlarged negative made on an 18 x 24 cm rapid plate from which the print was made on Gum bichromate Noir vieille gravure.

Honorable mentions were awarded as follows:

A Sun Baby	Jas. H. Grime
Recess	C. J. Milne, 3rd
Awaiting the Master's Hand	C. W. Pratt
Illumination	C. B. Rosher
August Landscape	Edwards H. Smith
Sunshine & Shadow	Sterling Smith, Jr.
I'll Help Myself	E. S. Van Sickle

Commendations were awarded as follows:

Trixie Girl	M. P. Andrews
The Fresh West Wind	Stuart G. Baits
Into the Clouds	Wm. E. Barr
Bathing	Anton Berest
Old Indian Trail	H. J. Brennan
Pasture Pond	Miles J. Breuer
The Baby	Elmer Bridges
Childhood Happy Hours	E. J. Browne
At Rest	Marjorie Brown
Peek, Your Majesty, the Sea	Howard C. Cloyes
A Posy for the Postman	Ralph E. Cole
Beside the Spreading Chestnut	Earle H. Cooper
Learning to Pose	Ross Cowan
Sky Way	O. G. Danewit
A June Day Vista	Victor E. Darnell
A Haunt of My Youth	Chester Demaree
Falls of a Mountain Stream	Miss Alma De Vore
Mounts Madison and Adams	Herbert L. Douglas
In the Wisconsin Dells	L. O. Field
Portal to a Sylvan Dell	Alvin L. Fischer
The Clam Digger	Hollis M. French
My Cousin	E. P. Gavilan
Home	Edw. L. Gilroy
Juvenility	Davis Hammerli
Dinner Time	F. J. Harris
Turbulent Waters	Willard H. Harting
The Sleet Storm	Ralph S. Hayes
Threatening Sky	I. Higo
Waiting for the Chimes	Ellen C. Hildebrand
Looking Into the Future	Mrs. Alice K. Hinkley
Woodcliff Lake	Henry M. Hyman
The Path Through the Pines	Mrs. C. H. Johnston
Playing with Sand	W. Keibel
The Road from Plainville	Jas. B. Kent
The Flume	W. W. Kuntz
Venus	Henry Lam
Reflection	Th. L. Lim
The River	James S. Loomis
A Little 20th Century Flapper	Howard F. Louis
The Torrey Pine	Franklin G. McIntosh
The Old Homestead	H. J. Mahlenbrock
Through the Columns	Philip Mehler
Sunny Day	H. E. Morehouse
Along the Waterfront	Geo. F. Munson
Sweet Idleness	Jennie H. Oliver
A Morning Sentinel	Vernon Peakes
The Walnut Hills Cabin	Harvey C. Pendery
Canning Season	Margaret Peters
A Setting Sun	W. H. Pote
Feather River	F. E. Pugh
Daisies	C. L. Richardson
Nature's Peacefulness	F. H. Robinson
Mother	Frank L. Roya
Along the Charles	Howard K. Rowe
Cutting Potatoes	A. H. Scott
The Old House by the Road	Mason H. Seabury
Shady Road	L. A. Shaver
Portrait of a Lady	Ivan Sokoloff
A Study in Headgear	Ernest Steiner
Springtime in the Woods	Frank Streith
Willow Pond	W. L. Thompson
Morning Calm	A. M. Tomlinson
A Home Portrait	K. Tsubone
Home Again	J. W. Varian
Begging	W. R. Walton, Jr.
In the Doorway	R. H. Watson
The Orphan	Mrs. M. N. Wilcox
Landscape	John B. Ziemanski

ROLL OF HONOR

FIRST PRIZE

J. H. Field 9 — George W. French 5

SECOND PRIZE

H. B. Rudolph 7 — Alexander Murray 6
Kenneth D. Smith 7 — Lyle A. Morse 5

THIRD PRIZE

J. Herbert Saunders 8 — Jarded Gardner 6
W. R. Bradford 6 — Wm. J. Wilson 6
Mrs. Sterling Smith 5

HONORABLE MENTION, SENIOR CLASS

W. Kitchen 12 — Edwin B. Collins 8
Sotaro Saba 12 — Lawrence Baker 7
Louis A. Dyar 11 — F. A. Northrup 6
Herbert J. Harper 10 — Louis R. Murray 6
Fred E. Crum 9 — Walter L. Bogert 5
Juventino Ocampo 9 — Warren R. Laity 5
Walter Rutherford 9 — James Thomson 5
Elizabeth B. Wotkyns 5

COMMENDATION, SENIOR CLASS

Dr. E. L. C. McGinnus 17 — Geo. Miller, Jr. 9
J. A. Singler 17 — Jiro Ito 8
Gus Schinkel 16 — W. H. Finch 7
Carlos F. DeMoya 14 — Paul E. Guillot 7
E. E. Jones 14 — Gregory L. Oliver 7
Arthur Palme 14 — Roy H. Heiser 6
Julien J. Proskauer 14 — Wm. B. Imlach 6
F. E. Bronson 13 — M. L. Shattuck 6
B. M. Whitlock 13 — Chas. T. Graves 5
C. M. Harris 12 — C. A. Heald 5
J. K. Hodges 12 — H. E. Horrigan 5
Frank R. Nivison 11 — Frank H. Luwen 5
A. C. G. Allison 10 — Herbert C. McKay 5
Leo Kraft 10 — James J. Ryan 5

HONORABLE MENTION, JUNIOR CLASS

J. W. Jeffers 6 — Robert E. DeLand 5
Edwards H. Smith 6 — Garnet E. Jacques 5
P. F. Squier 5

COMMENDATION, JUNIOR CLASS

John Ziemanski 28 — G. A. Smith 9
W. Keibel 25 — Ralph Beebe 8
F. H. Chant 23 — Thomas C. Higgins 8
Nat S. Smith 19 — Mrs. C. H. Johnston 8
Howard E. Louis 18 — Hannah G. Myrick, M. D. 8
Harvey C. Pendery 18 — E. J. Williams 8

Wm. E. Barr 17
H. J. Brennan 17
Edw. L. Gilroy 17
Paul Richardson 17
W. W. Kuntz 15
Howard K. Rowe 15
L. Archambault 14
H. J. Mahlenbrock 13
Miles J. Breuer 12
J. R. Frow 12
Willard H. Harting 12
C. V. Hewitt 12
A. S. Workman 12
Walter P. Bruning 11
Simon Jochamowitz 11
Ivan Sokoloff 11
Herbert L. Douglas 10
Fred Goodin 10
M. W. Osterweis 10
John H. D. Blanke 9
Chester Demaree 9
A. T. Flikke 9
Stephen J. Palickar 9
Ford E. Samuel 9
E. J. Browne 7
Geo. L. Heath 7
John Janson 7
Dr. C. W. Pratt 7
J. L. Clyburn 6
Mrs. Ellen C. Hildebrand 6
Jas. S. Loomis 6
Arthur W. Moreau 6
A. M. Tomlinson 6
R. D. Wilson 6
Harold B. Winslow 6
Arthur S. Yoshida 6
Ralph B. Bonwit 5
H. H. Van Kennen 5
Franklin Chapman 5
Theo. M. Fisher 5
Ralph S. Hayes 5
Franklin G. McIntosh 5
Philip Mehler 5
James Owen 5
Hugh Palmer 5
W. H. Pote 5
C. B. Rosher 5

OUR ILLUSTRATIONS

The print entitled "A Photographic Book Plate" by Howard Rembrandt Van Ryn, who is a lineal descendant of the great painter Rembrandt Van Ryn, was made at the White School of Photography. It was the inspiration of a moment. The lettering was hastily chalked on a bit of wrapping paper with a marking crayon and the model, a fellow student in working clothes, posed rapidly but effectively. The result is the best photographic book plate which we have ever seen. It is highly decorative and not too obtrusive in suggestiveness. It also gets away from the rather hackneyed motive of the nude which seems to be the subject of a large number of all the photographic book plates which have been made. No data are available. Page 615.

Yvonne Park is the wife of the well-known British photographer, Bertram Park, whose work is familiar to all who have followed "Photograms of the Year," and is herself a photographer of no mean skill. Of recent years, she has produced a large number of most attractive studies of the nude in poses which are much out of the ordinary, and "Pandora," reproduced on page 617, is an interesting example. The pose seems at first sight a little strange but it fits the requirements of the title very well and is also well planned to minimize the deficiencies of the model. The attractiveness of the original print is largely in the subtle gradations of the flesh tones as well as in the suggestion of grief. No data.

"Becky," by Charles Henry Davis of New York, is an interesting example of typical high grade American studio work. While high in key, it is well modeled, brings out the characteristics of the subject well and furnishes a graceful and pleasing likeness. No data. Page 619.

"In a Land of Romance" by John M. Whitehead shows a type of scenery which we are not accustomed to associate with Scotland. The Lombardy poplar is more characteristically a tree of a somewhat warmer clime, but the introduction of these tall straight trees forms a pleasing vertical note well opposed to the horizontal line of the flat landscape and the stratification of the clouds. To the clouds, indeed, the beauty of the picture is due, for this landscape would be uninteresting without a strongly featured sky. The print is a composite made from three negatives enlarged onto 10 x 12 Imperial plate and printed on Vitegas gaslight paper. Page 621.

"Morning Light" by Ernest M. Pratt shows how a commonplace grouping of trees in urban surroundings may be turned into a mysterious and beautiful picture by selecting the proper light and atmospheric conditions. The grouping of the trees is conventional but the strong light into which the camera was pointed and the obliteration of existing details by the present mist have added accents and mystery which produce a most interesting composition. No data. Page 623.

"Sisters" by Salome E. Marckwardt, one of a number of prints awarded third prizes in the Senior Competition for November 1921, was printed on grainy stock and in such a color that the engraver has failed to give us an adequate reproduction of the charm of the original gum print. The subject is attractive and the original has a beauty of texture and value which does not appear in the production. Page 627.

Two other prize winning pictures in this same competition are reproduced on page 628 and 629, "Winter Sunshine" by Alexander Murray and "In Old Whitby" by J. Herbert Saunders. By some unfortunate accident the data for these prints are not at present available, but the prints themselves will undoubtedly impress our readers as interesting treatments of roads. The composition is similar and in each figures are introduced to add a human touch.

Mr. Soichi Sunami does not seem to have added anything to the meaning of his picture "Song of Spring" by the title. It is a charming figure study but this is all and this is enough. The picture was worth taking for its own sake, but the invention of a title has not conferred upon it any added dignity or merit. This was made in Seattle, Washington, with a 5 x 7 Studio camera fitted with a 12-inch Heliar lens. The exposure at 3 P. M. in May in soft studio light was a short time exposure at *f*:4.5. The Eastman portrait film was developed in pyro and printed on Artura carbon black E rough. Page 645.

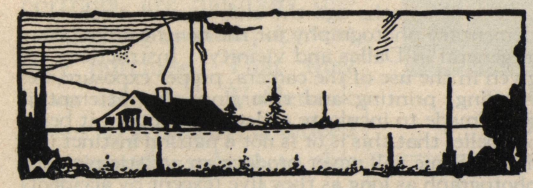
"Master Jack" by W. A. MacQuown is one of those child portraits which tells its story at a glance and which is almost impossible to criticize. The artist has got his model interested and has made his exposure at the right moment. The result is a picture which pleases all who see it. Made with an 8 x 10 view camera, fitted with a 12 inch Goerz Dogmar. The exposure at 11 A. M. in December at a north window was about ½ second *f*:5.4. The Seed 30 plate was developed in pyro and printed on Iris E rough. Page 647.

"Cheat River — West Virginia" by Charles K. Archer is one of those landscapes which seem made to order for the purpose of the painter. One does not find them every day, but when stumbled upon they compose themselves, provided the light is right. Here is scenery on the grand scale — a noble river, grand rocks and forests trees, and a background of

mysteriously receding hills. The picture was seen by the receptive eye and adequately recorded. Page 648.

"The Pool in the Patio" by R. C. Lewis is a sophisticated rendering of commonplace material in a distinguished composition. The naked pool in a bare lawn is not the easiest kind of picture material. The shadows, the introduction of the single pot of flowers and the veiling of the background have turned this into a subtle and pleasing decorative composition. Page 649.

On pages 650 and 651 we have two portraits both notable but diametrically opposite in all their characteristics. "Meditation" by Anna M. Smith is like a mural decoration in its flat tones, its artfully arranged drapery and its beautifully contrasting lights. "Helen" by J. G. Sarvent is even more simple in tone but gives a vigorous and forceful treatment because of its striking profile which is here so charmingly portrayed. One picture suggests classic repose; the other, the will to prompt and vigorous action.



NOTES AND NEWS

DIE DREIFARBENPHOTOGRAPHIE, by A. von Hübl. 4th edition. W. Knapp, Halle, A. S.

This well known work, an English translation of which has been published by Klein, now appears in its fourth German edition, which does not materially differ from the previous one. The main difference seems to be that the section dealing with plate sensitizing is rather curtailed, owing to the fact that the author has published a separate monograph on this subject. In the domain of subtractive printmaking the various processes are rather summarily and sketchily dealt with; photomechanical processes at greater length.

It is, however, in the treatment of the fundamental theories and practice of the subject as a whole that the value of the book lies, which has gained for it the high position it has held for some years. — E. J. W.

The Tenth Annual Exhibition of the Pittsburgh Salon of Photography under the auspices of the Photographic Section of the Academy of Science and Art, will be held in the Galleries of the Carnegie Institute, Pittsburgh, Pa., from March 2nd to 31st, inclusive, 1923. The Exhibition will be open daily 10:00 A. M. to 10:00 P. M., Sundays 2:00 P. M. to 6:00 P. M. Press view Friday, March 2nd, 1923, from 8:00 P. M. to 10:00 P. M.

The aim of the Pittsburgh Salon is to exhibit only that class of work in Pictorial Photography in which there is distinct evidence of personal artistic feeling and execution.

All work submitted to the Committee of Selection will be carefully and impartially considered and no preference will be given the work of members of the Salon.

All Pictorial Workers are cordially invited to contribute.

Conditions of Entry

No. 1. No picture eligible that has been shown at a National Jury Exhibition in the United States prior to April 1st, 1922.

No. 2. An entrance fee of seventy-five cents must accompany each entry form, addressed to the Secretary. This fee covers the entire entry.

No. 3. Pictures, except from Foreign Countries, must be mounted BUT NOT FRAMED, as the entire Exhibition will be hung under glass. Accepted foreign pictures will be mounted by the Committee.

No. 4. Mounts for pictures must not exceed 24 inches by 26 inches, and white or light toned mounts of medium or light weight stock should be used.

No. 5 Each picture must bear on the back, plainly written, its number, title, name of the artist and return address to agree with the entry form. Sale price on entry form only.

No. 6. Not more than six pictures may be submitted by any one contributor.

No. 7. Entries from the United States may be forwarded by post or express, but foreign entries should be unmounted and forwarded only by Post, marked "Photographs for Exhibition Only — No Commercial Vaue."

No. 8. All pictures must be sent prepaid and packed flat with sufficient, substantial protection for safe conveying both ways; and must reach destination not later than February 5th, 1923. USE ATTACHED SHIPPING TAG. They will be repacked and returned After Close of Exhibition, charges prepaid.

No. 9. Unless otherwise specified, permission to reproduce is presumed.

No. 10. All possible care will be taken but no responsibility is accepted by the Salon, for loss or damage in transit or at the gallery.

No. 11. The submission of pictures will be understood to imply acceptance of above conditions.

Address all COMMUNICATIONS (not pictures; see rule 8)

To CHAS. K. ARCHER, Secretary.
1412 Carnegie Building, Pittsburgh, Pa.

Entry forms may be had by addressing Mr. Archer.

At the recent election of the Milwaukee Camera Club the following officers were elected: B. C. Dimeen, President; John H. Becker, Vice President; A. J. Goerletz, Secretary-Treasurer; E. J. Schaefer, Librarian. The club is in a thriving condition, having nearly a hundred members. During July at the annual picnic almost two hundred people were present and everybody had a good time enjoying good fellowship and making pictures.

Gentlemen:

The Dallas Camera Club was founded slightly over a year ago by the association of five earnest workers with a vision of placing Dallas on the photographic map. One was a commercial photographer, another a newspaper man, a third was chemical man for a photo supply house in the city and the other two were just plain camera enthusiasts. Since that time the club has grown until, at the present writing, the membership stands at 35, and with bright prospects of increasing this figure until the authorized limit of 60 is reached.

At first the club met in the homes of the members, later, through the courtesy of two of the dealers in town, in stores in the city. Now the club maintains its own quarters consisting of an exhibition room and auditorium capable of seating approximately 100 people, darkrooms divided for developing, printing, enlarging and special work such as bromoil, gum, carbon, etc., complete developing, printing and enlarging apparatus is installed, and a studio is in course of construction. A special room is reserved for the ladies — the wives and guests of members. When the darkrooms were built, it was thought best to keep the washing of prints and negatives, and the mixing of chemicals separate from the actual developing and printing. The result is we have what is popularly known as "The Community Bathtub" for washing prints and negatives, and the darkrooms are thus kept dry and clean.

You will appreciate that, the organization being comprised of the class of workers it was, "pictorial" photography was more an ideal than an accomplished fact. During the year, however, a considerably higher standard has been set and it is the belief of the club that remarkable strides have been taken in this direction. A number of the members are planning to enter pictures in several of the coming fall exhibitions and we hope to prove this belief therein.

As far as the writer knows, Dallas, Texas, is the only city in the South with the exception of Baltimore, Maryland, that has a camera club. There are several reasons for this, but the principal one seems to be the temperature with which we have to contend. We have received exhibitions of pictures from northern clubs and within half an hour after hanging them, several of the pictures have come loose from the mounts and fallen to the floor. Mounting with glue or white paste, solid, seems to be the only solution of this difficulty. One widely advertised product is practically useless here. Some of the members have delved rather deeply into the hot water developing problem and we now have several formulas for developing negatives in water up to 100° without the use of formalin which, as you know, has a tendency to crack the gelatine. One of our formulas, in particular, is remarkable. With it we are able to develop, rinse, fix, and wash in *running* water at temperatures up to 95° without the slightest sign of fog, frilling, reticulation or even softening of the gelatine. We have not yet succeeded in working out formulas for doing this with paper, but are now working on the problem and, no doubt, will finally solve it. The average temperature of the water here is 90° to 92° in summer. The air is considerably higher and the use of ice is rather expensive, not to mention "messy," and, even with ice, it is practically impossible to maintain uniform temperatures. We honestly believe that, when we have solved the paper question, you will see other clubs spring up in the south. In fact, we have received numerous inquiries from people in Fort Worth, Texas, who want to establish a club but are deterred principally because of the temperature problem. If they do organize, they will have numerous other questions, trials and tribulations, as the writer knows, having been with this club since about two months after it was organized.

But, Dallas being the only city in the South that has a camera club, we are getting pretty enthusiastic support from various sources in the city. Dallas is a progressive city and believes strongly in advertising. The club has been written up several times in "Dallas" the official publication of the Chamber of Commerce, we have had lots of newspaper publicity, including four full page "spreads" in the Sunday Magazine supplement of the Dallas News. This has been of great assistance to us.

Last night, the annual election of officers was held with the result that Mr. A. M. Belsher was elected president, Mr. V. H. Schoffelmayer was elected Vice President, Mr. E. H. Brown was re-elected Secretary-Treasurer, and Messrs. Wm. C. Morton and H. M. Sutton were elected members of the Board of Directors to serve with the three officers named.

One of the main difficulties of a new club, that of finances, has been solved and, with his factor out of the way, the club should grow fast from now on.

Several months ago the club opened a school in elementary photography for the benefit of kodakers in general in Dallas and vicinity. Instructions are given in the use of the camera, proper exposure, developing, printing and enlarging. No attempt is being made to inculcate artistic perception, it being our belief that this is or is not a natural instinct in a man. Some will never produce an artistic pictorial photograph as long as they live (except by accident) while others will never produce anything else. So, the efforts of the school have been confined strictly to technical detail and in spite of the poor attendance, we have been fairly successful in this. Two men joined the club after attending the school for some time, and we believe others will follow. No charge is made for the instruction, it being open to any amateur photographer in Dallas county.

In November the club plans to hold an exhibition of pictorial photography and we hope to give the people of Dallas a new conception of what photography is, or may be. This exhibition will be limited to members of the club as it is really more of an advertising stunt than a competition. The club holds competitions once a month for the members, but the annual exhibition is intended first, to give the members an opportunity to display their work to the public, and to advertise the camera club. We are well aware of the fact that publicity, the right kind, and lots of it, are vital to the well being and growth of the club. With this in mind we arrange stunts that will not only be of benefit to the members but will make good newspaper "copy." One of the best we had was "Dallas by Night" in which the members made night photographs of the imposing skyline of the city from various angles. The News ran a full page spread of this and the picture that won the first prize has been printed and reprinted all over the state, as well as in at least one national magazine. — E. H. BRAUN, Sec.

FORTHCOMING EXHIBITIONS

Place	Date	For information write to:
Frederick & Nelson	Nov. 6 to 18 inclusive	Frederick & Nelson, Seattle, Wash.
Camera Pictorialists of Los Angeles		N. P. Moerdyke, Secretary
Closing date for entries, November 1st, 1922	Nov. 20 to Dec. 11	811 Washington Bldg., Los Angeles, California
Pittsburgh Salon		Chas. K. Archer
Closing date for entries, February 5, 1923	March 2 to 31, 1923	1412 Carnegie Bldg. Pittsburgh, Pa.

Wollensak World

PUBLISHED BY THE
WOLLENSAK OPTICAL COMPANY
ROCHESTER, NEW YORK

DEVOTED TO
LENS AND SHUTTER
INFORMATION

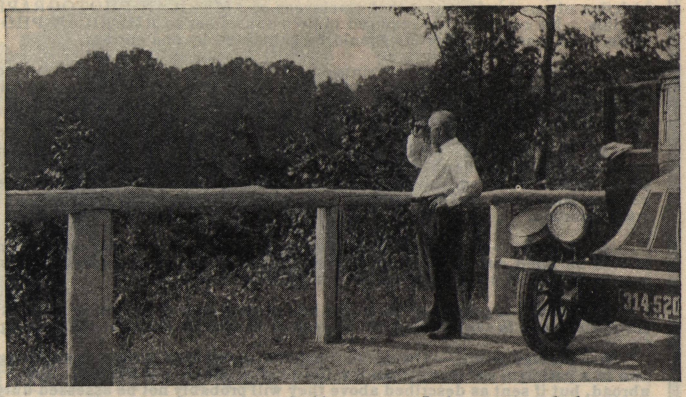
VOL. II — OCTOBER, 1922 — No. 10

Ask the men who use them!

Professional photographers, who derive their income from the making of portraits, are naturally discriminating in the equipment they purchase. That they have adopted Wollensak lenses so generally, is indeed a noteworthy tribute to this line of photographic objectives.

Ask the opinion of representative artists like Towles of Washington, Garo of Boston, Weston of California, or Ellis of Philadelphia, why they are using Wollensak lenses. You will find the answer in the beautiful softness of Verito portraits and landscapes, the all-round utility of the Velostigmat, or Vitax results in portraiture and child photography.

A lens, too, may be known by the company it keeps.



This illustration serves a double purpose. It demonstrates the keen-cutting qualities of the Series IV Velostigmat f6.3 and illustrates the Pockescope (our 4½-time pocket telescope) in actual use.

Found in the Finder

POCKESCOPE, the $2.00, 4½-power, pocket telescope, is made by the same workmen who make Wollensak photographic lenses. That's why it's so good.

SANTA BARBARA newspapers devote several columns to a description of a beautiful photographic exhibit by Samuel Adelstein. Every picture in the exhibit was enlarged through the Verito.

***

THE ONLY THING that compares with a Pockescope in quality and price is another Pockescope.

***

YOUR CHECK (X) beside this paragraph, with your name and address on the margin, will bring our beautiful 1922 catalog. If you are interested in lenses, you should have this book.

***

YOUR CHECK for $2.00, your name and address and the word "Pockescope" on a slip of paper, is all the order necessary, *provided your dealer can't supply you.* Cash or money order if you prefer. Return if unsatisfactory.

Our Third Annual Competition

For the encouragement of pictorial photography the publishers of AMERICAN PHOTOGRAPHY have instituted an annual competition in addition to the various monthly competitions now held. The closing date of the third competition will be February 1, 1923. The rules of the competition are as follows:

1. Eligibility.—The competition is open to any individual photographer in the world, without entrance fee or restriction of any kind, except that employees of AMERICAN PHOTOGRAPHY or members of their families are not eligible. No contestant is required to be a subscriber to AMERICAN PHOTOGRAPHY. Joint entries are not eligible. No more than 5 prints should be submitted by one entrant.

2. Character of prints.— Prints on paper made by any photographic process except blue printing may be entered. The exposure must have been made by the contestant. Developing, printing or enlarging may have been done by another but as the pictorial character of the work will be the basis of judging, work done by commercial finishers is not likely to be of a character to receive high recognition. Hand-colored prints are not eligible.

3. Size of prints — Prints may be of any size desired by the maker, up to 11 x 14. They may be mounted or unmounted, but must not be framed. If mounted, the largest mount should be stiff enough to enable the print to stand on an easel. It is requested that no mounts larger than 14 x 17 be submitted. Prints should be carefully packed in cellular board and will be returned in the original wrappings. We accept no responsibility for damage to prints in transportation.

4. Titling. — Nothing but the title and sender's name and address may be placed upon the back. Full data should be filled out on the form below and any reasonable number of these forms will be sent on request. Prints may be regarded as ineligible if the data are not furnished.

5. Return of prints. —Prints will be returned only if request is made at the time of entry and if sufficient postage for their return is sent. They will be returned immediately after the judging, except those to which awards are made.

6. Foreign prints.— Owing to customs regulations prints from foreign countries should be sent not more than two in a package, not larger than 8 x 10 in size, and without writing. We do not undertake to pay duty on prints from abroad, but if sent as described above they will probably not be assessed duty, especially if marked "Amateur prints—no commercial value," on the outside of the wrapper.

7. Prizes: — Prizes will be awarded as follows:

First Prize.....$100.00 cash	Third Prize.....$25.00 cash
Second Prize.....$50.00 cash	Fourth Prize.....$25.00 cash
Fifth to Fourteenth Prizes .....$10.00 each	

The judges will also be authorized to award about fifty Honorable Mentions of the value of $2.50 each, payable in subscriptions to AMERICAN PHOTOGRAPHY or books of our own publication. Prints awarded prizes are to remain the property of the publishers. Any prize may be declined, if the competitor prefers to retain the print. Prints awarded Honorable Mention may be reproduced by them if desired, but will be returned if request is made.

8. Judges — The judges will be photographers, artists or critics of repute, their names to be announced later.

9. Exhibition. — The publishers of AMERICAN PHOTOGRAPHY reserve the right to retain prints deemed worthy of exhibition for a reasonable period, and will endeavor to arrange public exhibitions of the best prints before several Camera Clubs in Boston and elsewhere, as soon as possible after the closing of the contest.

10. Forwarding.— Prints must be forwarded to AMERICAN PHOTOGRAPHY, 428 Newbury Street, Boston 17, Mass., express or postage prepaid. Closing date is February 1, 1923.

Title.....Where Made?.....

Maker's Name.....

Address.....

Return or not?.....Amount of postage inclosed.....Camera....Size.....

Lens.....Focal Length....in. Stop used, *f:*.....Filter.....times

Date.....Hour.....Light.....Exposure.....

Brand of film or plate.....

Developer.....

Printing paper (state grade in full).....

Please give as full data as possible regarding special manipulations, as hundreds of our readers ask us how exhibition prints are made.

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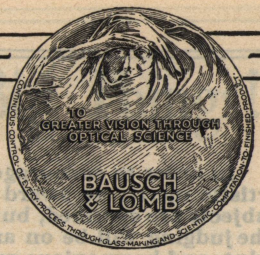

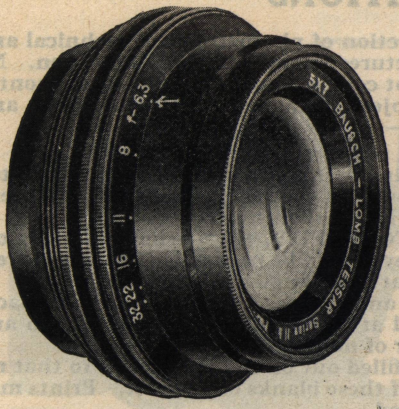

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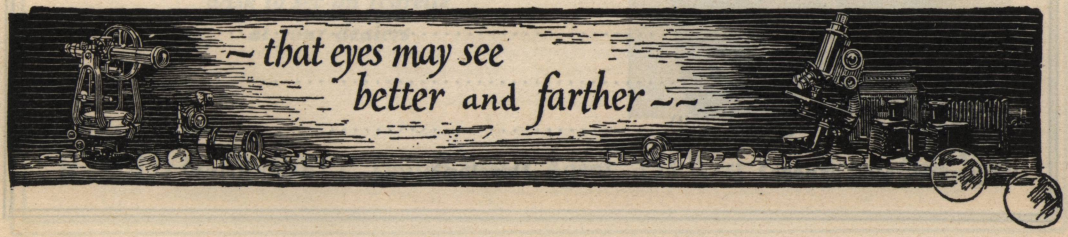

OUR COMPETITIONS

In order to encourage our readers in the production of photographs of technical and artistic merit, we award prizes each month to pictures submitted in competition. No subjects are specified, but prints of any kind, except copies, may be entered each month. The judging will be on artistic arrangement of subject, technical work on negative and print, and harmonious mounting. The rules are:—

1. Any photographer, professional or amateur, may compete.
2. Not more than three prints may be entered in any monthly competition, mounted or unmounted. Entries for each month will be closed on the 15th. Prints must be sent by individuals and not by two or more competitors in collaboration.
3. Prints should be sent to AMERICAN PHOTOGRAPHY, 428 Newbury Street, Boston 17, Mass., express or postage fully prepaid. They should be packed between two layers of cellular board, so cut that the corrugations run at right angles to each other.
4. If anything beyond title and sender's name and address are placed upon the back, prints are subject to first-class postage. If mailed at third-class rates, the coupon and postage for return must be sent in a separate letter of notification.
5. Every print submitted must have full data filled out on a form similar to that reproduced below. Any reader may obtain a supply of these blanks on request. Prints may be regarded as ineligible if the data are not furnished.
6. Prints will be returned ONLY if request is made at time of entry, and if conditions of Rule 4 are observed. We accept no responsibility for safe return or condition of prints, but will endeavor to pack safely and return in good condition.
7. Each competitor agrees by making entries that any of his pictures may be reproduced, with criticism, by the publishers of AMERICAN PHOTOGRAPHY.
8. There will be two classes: Junior and Senior. Entries in the Junior Class will be accepted from those who have not won 5 Prizes in our competitions. After a competitor has entered the Senior class he must not return to the Junior.
9. Prizes of $10.00, $5.00 and $3.00 in value in the Senior Class and of $5.00 and $2.00 in the Junior Class will be placed at the disposal of the judges each month. They may also award Honorable Mention and Commendation at their discretion. A six months' subscription to AMERICAN PHOTOGRAPHY is awarded with each Honorable Mention. The judges are authorized to withhold one or more prizes if the quality of the prints submitted is not satisfactory. Prizes will be paid in goods selected from the lists of any of our advertisers, books, or magazines. Winners are invited to notify us of their choice of prizes promptly after publication of the awards in the magazine. Prize winning prints become our property.
10. Every contestant, by entering pictures, agrees to accept all conditions and awards.

Title .....

Where was picture made? .....

Maker's Name .....

Address.....

If for competition, in which class? .....

Return or not?.....Amount of postage inclosed.....Camera.....Size .....

Lens.....Focal Length.....in. Stop used, f.....Filter.....times.....

Date.....Hour.....Light.....Exposure .....

Brand of Film or plate .....

Developer .....

Printing Paper (state grade in full).....

Did you yourself expose?.....Develop?.....Print? .....

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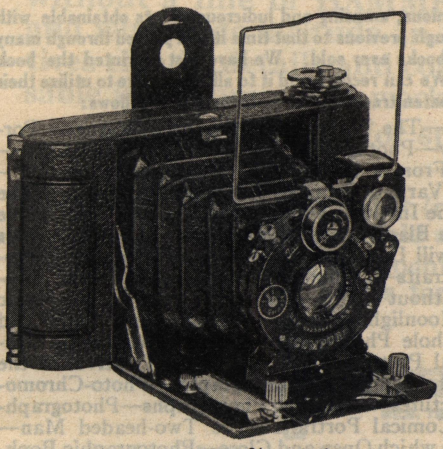

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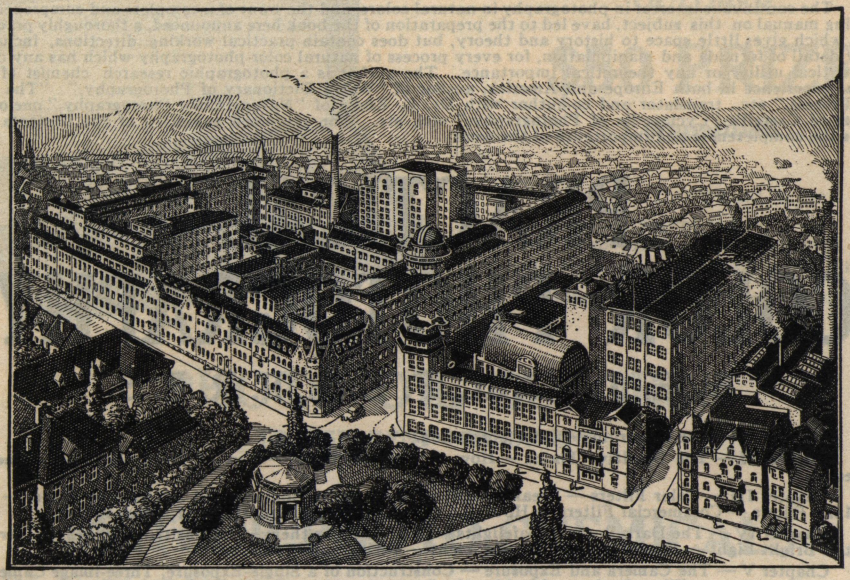

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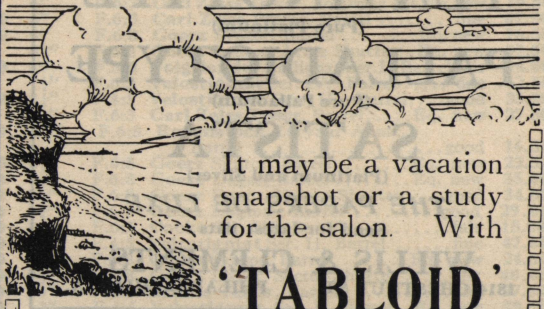

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2″	F.3:2	**Voigtlander** Helomar, Barrel fine	17.50
2″	F.2:5	**Faliez** Siamar, Barrel ..... Eq. new	12.50
2 1/5″	F.2:5	**Faliez** Siamar, Barrel ..... Eq. new	12.50
2¼″	F.2:5	**Faliez** Siamar, Barrel ..... Eq. new	12.50
3″	F.2:5	**Faliez** Siamar, Barrel ..... Eq. new	12.50
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5¼″	F.6:3	**Wollensak** Vinco Anastigmat Barrel fine	8.50
5″	F.6	**Voigtlander** Dynar, Acme Shutter good	10.50
5¼″	F.6:8	**Voigtlander** Collinear, Barrel.. fair	9.50
4⅝″	F.6:3	**B. & L.** Tessar No. 3, Optimo Shutter..... Eq. new	17.50
5″	F.6:3	**B. & L.** Tessar No. 3, Optimo Shutter .....fine	14.50
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5″	F.7:5	**Turner** Reich Convert. Anst.—Old Model Auto Shutter .....fair	7.50
6″	F.7:5	**Turner** Reich Convert, Anast. Koilos Shutter ..... good	17.50
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4¾″	F.4:8	**Goerz** Celor Barrel.....good	17.50
5″	F.4:5	**Goerz** Dogmar, Barrel .....fine	22.50
5¼″	F.4:5	**Goerz** Dogmar, Acme Shutter Eq. new	27.50
5¼″	F.4:5	**Goerz** Dogmar, Barrel .....good	22.50
5-10¾″	F.7:7	**Cooke** Telar, Barrel .....good	12.50
6″	F.6:3	**Zeiss** Kodak Anast. No. 3, Barrel good	14.50
6″	F.5	**Zeiss** Unar, Barrel .....good	20.00
6″	F.4:8	**Goerz** Celor, Barrel .....good	20.00
6″	F.4:5	**Carl Zeiss** Tessar, Focusing Mt. good	27.50
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6″	F.5:4	**Ross** Homocentric, Barrel ..... good	19.00
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6 3/5″	F.4:5	**Cooke** Ser. II Barrel.....good	22.50
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7″	F.4:5	**Ernemann** Double Anast.-Sunk Mt. fair	18.50
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8″	F.5:4	**Collinear** Ser. II—No. 4 Barrel.. fine	42.50
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6″	F.6:8	**Koehler** Anst., Sector Shutter ....fair	5.00
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6″	F.6:3	**Carl Zeiss** Protar, Barrel .....fine	37.50
6″	F.6:8	**Goerz** Syntor, Barrel .....Eq. new	16.50
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By Adolphe Armand Braun

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The book contains a remarkable series of various child poses nude and draped, and of facial expressions and action studies.

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In the selection "Child in Art" Mr. Braun has brought together an important series of reproductions of this work by the great masters. In the section "The Child in Religious Art" there are paintings of the Virgin and Child, and Holy Family, by such great artists as Michelangelo, Leonardo da Vinci, Raphael, Botticelli, Murillo, and others.

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American Photographic Publishing Company

428 Newbury Street, Boston 17, Mass.

Prize print in J. G. Marshall May Competition by Roland M. Weed, Detroit, Mich.

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Besides, you have the privilege of testing what you purchase, 10 days. After which time, if unsatisfactory, you can return and we will refund in full.

REMEMBER TOO:—

that we PREPAY TRANSPORTATION on all orders calling for new Cameras, Kodaks, or Lenses, excluding View outfits, and supplies.

WE HAVE HUNDREDS OF

unsolicited testimonials from customers who are pleased with our service as well as merchandise. We can do likewise for you.

WE BUY OR TRADE OUTFITS

Perhaps you have one you wish to trade or sell. Send in a complete description of it, and we will make you the very best offer in cash or trade.

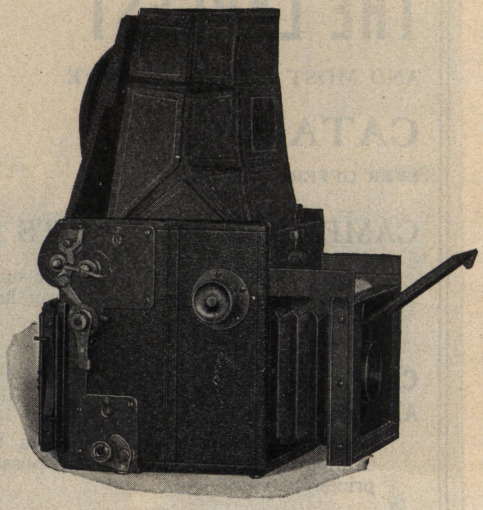
ASK FOR OUR SPECIAL BOOK

of used BARGAINS
issued free on request.

Central Camera Co.

Dept. A-56, South Wabash Ave.,

CHICAGO, ILLINOIS



Auto Graflex Junior

This little camera thrives on difficult tasks and makes easy ones still easier. For in it are combined all the Graflex features; yet its greatest dimension is five inches and it weighs under two and a half pounds.

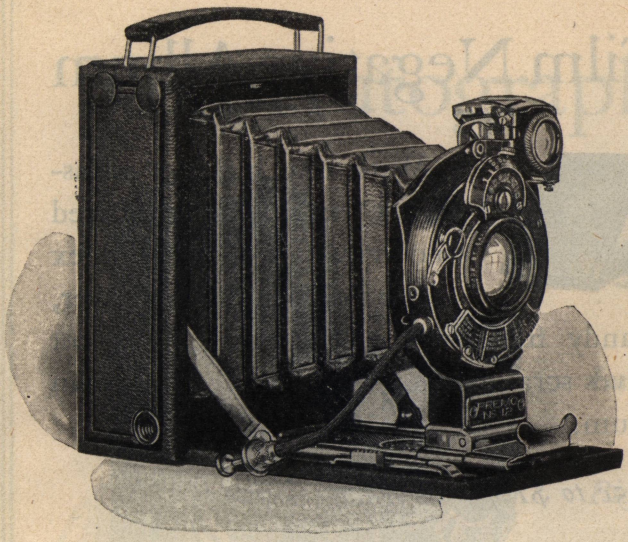
Like its larger brothers this Graflex has the focal plane shutter (speeds 1/10 to 1/1000 of a second) and the reflecting mirror. Thus it offers a speed for any occasion and the assurance of sharp focus and good arrangement.

Auto Graflex Junior makes 2¼ x 3¼ negatives, well defined, by fast lenses. Equipped with Kodak Anastigmat *f.* 4.5 the price of this convenient little camera is $85.

Graflex catalog by mail or at dealers'

EASTMAN KODAK COMPANY

Folmer & Schwing Department Rochester, N. Y.



Premo No. 12

Kodamatic shutter
and
Kodak Anastigmat
lens *f.* 6.3

Combined in this pocket camera are special features that help make superior pictures:

Kodamatic shutter has speeds of 1/2 to 1/200 of a second. Kodak Anastigmat lens *f.* 6.3 works fast and cuts sharp.

Focusing is done with scale and finder or with the hinged ground glass. Film pack adapter and plate holder are included in regular equipment.

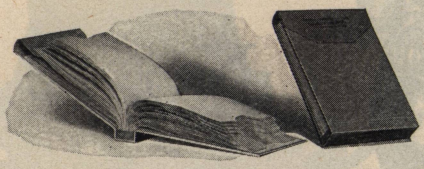
Premo No. 12 makes 2¼ x 3¼ pictures. Equipped with Kodamatic shutter and Kodak Anastigmat lens *f.* 6.3 its price is $53.00.

At Kodak dealers'

EASTMAN KODAK COMPANY

Rochester Optical Department ROCHESTER, N. Y.

Eastman Film Negative Album

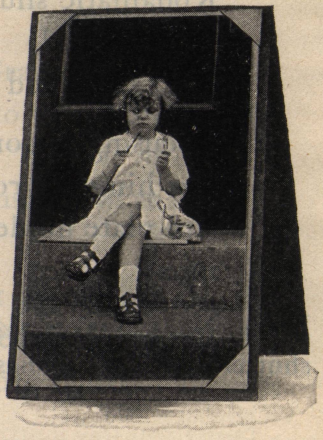


With one hundred transparent envelopes numbered to correspond with the index on the inside of the stiff cover, this album is a handy file for your negatives. No lost negatives, no negatives scratched or soiled in the Eastman Film Negative Album.

Price 75c to $1.75 according to size

Amateur Folder

An attractive mount and a practical protection for mailing, carrying or displaying your prints. Made of handsome, marble grey, extra durable stock. The print is inserted under the corners—no pasting, no muss. For vertical or horizontal prints.

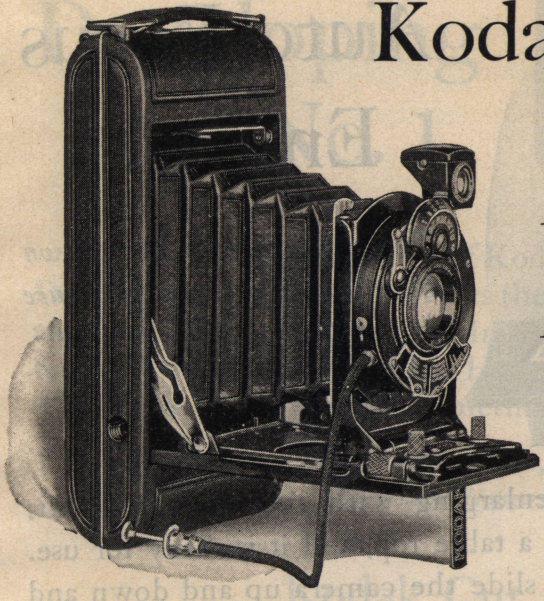


Price per dozen, 50c to 60c according to size

EASTMAN KODAK COMPANY
ROCHESTER, N. Y.

At your dealer's

No.1 Autographic Kodak *Special*



Large in scope—
small in size

Pictures—
2¼ x 3¼ inches

Kodamatic Shutter with an exceptionally comprehensive range—seven speeds from 1/2 to 1/200 second, time and bulb actions—fits this *Special* for virtually every picture in the amateur class.

Kodak Anastigmat *f.* 6.3 gives each print the clean-cut sharpness that distinguishes results with this Eastman-planned, Eastman-perfected lens.

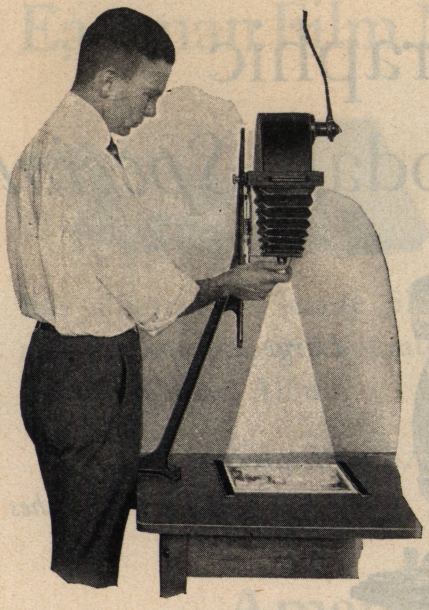
Yet the camera is so small you can cover it with your hand.

Price $50.00

EASTMAN KODAK COMPANY

ROCHESTER, N. Y., *The Kodak City*

At your dealer's



Kodak Auto-Focus Enlarger

To expose, simply turn down the exposure lever as the figure in the illustration is doing.

This device means enlarging with the effort left out. Clamp the Enlarger to a table top, and it is ready for use. Loosen a thumb screw, slide the camera up and down and you make the image larger or smaller, while the focus, automatically controlled, stays sharp.

Kodak Auto-Focus Enlarger accommodates either film or plate negatives up to 4 x 6 inches and makes prints on Bromide Paper up to 14 x 21 inches. Complete with Kodak Anastigmat Lens, negative holder, paper holder, set of flexible metal masks in six sizes and electric cord and plug; but without the 60-watt Mazda lamp required for illumination.

Kodak Auto-Focus Enlarger (including Excise Tax) $35.00

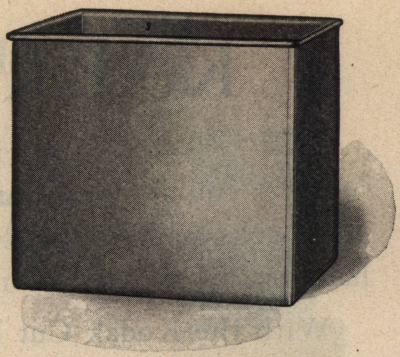
Diffusing Disc, for soft focus effects 1.00

EASTMAN KODAK COMPANY

ROCHESTER, N. Y.

At your Kodak dealer's

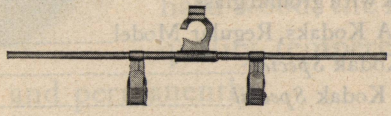
Kodak Developing Box, No. 1



For uniform development of Kodak Cut Film, the Kodak Developing Box, No. 1 provides the ideal means, quick, easy and sure. Capacity, twelve films, each suspended from a Kodak Cut Film Developing Hanger. Development by the usual time and temperature method.

Kodak Developing Box, No. 1 $2.00
(Without Hangers)

Kodak Cut Film Developing Hanger



For use with the Kodak Developing Box, No. 1. The Hanger is considerably longer than the box so it lies securely across the top, while the clips of monel metal grip the film firmly.

Price, each, 20c

EASTMAN KODAK COMPANY
ROCHESTER, N. Y., *The Kodak City*

At Kodak dealers'

Kodak Cut Film

Gives you all the advantages of plates with none of their drawbacks and yields you superior negatives free from halation.

With the Kodak Cut Film Sheath any plate holder can be adapted for use with Kodak Cut Film. Thus its advantages may be secured for all plate cameras of amateur size and, with the addition of the Combination Back, for both regular and *Special* models of the Nos. 3 and 3A Kodaks.

Prices

	2¼ x 3¼	3¼ x 4¼	3¼ x 5½	4 x 5	5 x 7
Kodak Cut Film, doz.	$0.46	$0.67	$0.93	$0.93	$1.50
Kodak Cut Film Super Speed, doz.	.52	.77	1.03	1.03	1.65
Kodak Cut Film Sheath	.10	.10	.15	.15	
Eastman Film Kit					.35
Combination Back with ground glass, for Nos. 3 or 3A Kodaks, Regular Model					4.00
Ditto, for No. 3 Kodak *Special*					4.50
Ditto, for No. 3A Kodak *Special*					5.00

The Prices of Kodak Cut Film Include the Excise Tax

EASTMAN KODAK COMPANY

ROCHESTER, N. Y., *The Kodak City*

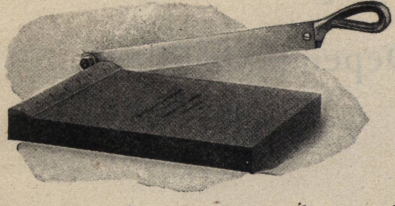
All Dealers'

Kodak Film Clip

With its ample width of two inches and its strong, toothed jaw, this clip is suited for any negative in the amateur sizes. Made of monel metal, the grip on the film is sure and will not weaken with usage.

Price, each, 30c

Kodak Trimming Boards



Kodak Trimming Boards are durably made of well-seasoned, hard wood; the knife is of good quality, tempered steel; the rule is marked plainly and permanently.

No. 1, capacity, 5 x 5 inches $0.65
No. 2, capacity, 7 x 7 inches .85

EASTMAN KODAK COMPANY
ROCHESTER, N. Y., *The Kodak City*

All Dealers'

HOOPER PRINTING CO.
BOSTON, MASS.